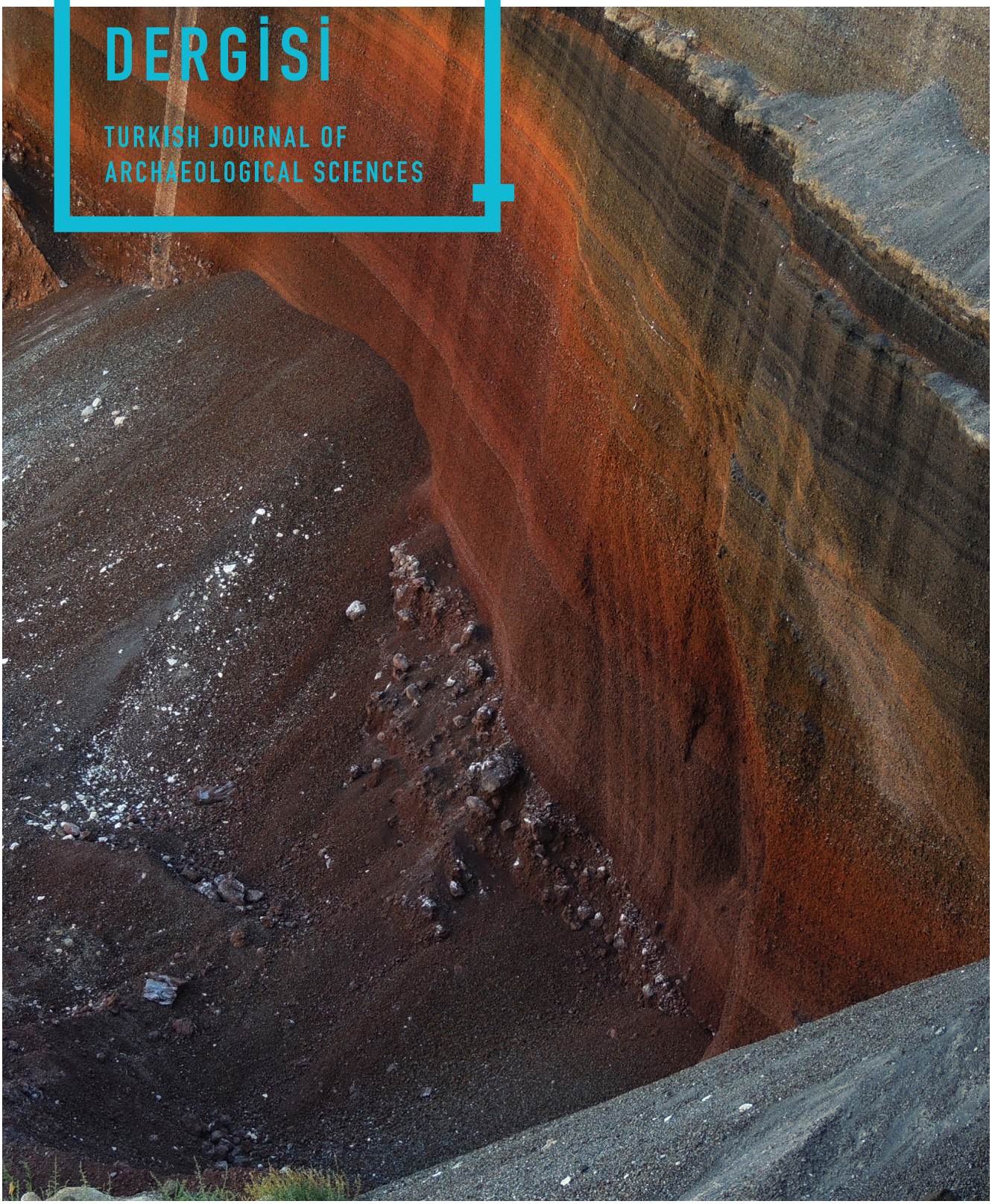
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Editörlerden

Dünyaya açılmamızı sağlayacak Arkeoloji Bilimleri Dergisi'nin ilk sayısı ile hepinize merhaba diyoruz.

Arkeoloji bir süredir geçmişin yorumlanmasında teknoloji ve doğa bilimleri ile yoğun iş birliği içinde yeni bir anlayışa evrilmekte. Üniversiteler, ilgili kurum ve enstitülerde her yeni gün açılmakta olan "Arkeoloji Bilimleri" bölümleri ve programları, geleneksel anlayışı yavaş yavaş terk ederek değişen yeni bilim iklimine adapte olmaya çalışmaktalar. Arkeoloji disiplininin geçmişi, geçmişte yaşayan insanların yaşam biçimlerini bütüncül bir şekilde anlamaya, hızla gelişen ve yaygınlaşan teknolojilerle her geçen on yılda daha fazla yaklaşıyor. Arkeolojik araştırmalar, sorgulama ve değerlendirme biçimleri, bu yeni bilim üretme biçimine dönüşüyor. Derginin editörleri olarak bizler, bu süreçte, bu dönüşüme katkı sağlayacak bir mecra oluşturmanın önemli olduğu kanısındayız.

Amacımız arkeoloji içindeki arkeobotanik, arkeozooloji, alet ve bina teknolojileri, tarihlendirme, mikromorfoloji, biyoarkeoloji, jeokimyasal ve spektroskopik analizler, coğrafi bilgi sistemleri, iklim ve çevre modellemeleri gibi farklı uzmanlık alanlarının çeşitlenerek yaygınlaşmasına katkı sağlamak ve arkeolojide bilimsel yöntem ve analizlerin geliştirilmesi ve uygulanması üzerine çalışan bilim insanlarını bir araya getirmek. Elbette yeni ve özgün metodolojik ve kuramsal yaklaşımlar üzerine yapılan araştırmalara da yer vereceğiz. Destek, katkı ve ilginizi derginin seyri ve gelişimi adına çok önemli görüyoruz.

Güneş Duru & Mihriban Özbaşaran

ARKEOLOJİ BİLİMLERİ DERGİSİ
TURKISH JOURNAL OF ARCHAEOLOGICAL SCIENCES

Note from the editors

We would like to take this opportunity to introduce ourselves to the world, and say 'hello' to the archaeological media with the very first issue of our new archaeological journal: The Turkish Journal of Archaeological Sciences.

For the past couple of decades archaeology has been evolving in close cooperation with new technologies and the advances in the natural sciences towards new understandings and interpretations of the past. More and more newly established departments and programs in universities and other relevant institutions focus on "Archaeological Sciences" as they try to adapt to a changing climate, and gradually abandon older traditions. Rapidly developing technological, methodological and analytical advances move us closer to understanding the way of life in past communities in a holistic way. Archaeological research programs, and the many innovative new ways of testing, inquiring and evaluating these all converge into this new way of producing 'science'. As the founding editors of the TJAS, we think it is important to have a medium that will contribute to this transformation.

Our goal is to contribute to the diversification and dissemination of different areas of expertise such as archaeobotany, archaeozoology, tool and building technologies, dating methods, micromorphology, bioarchaeology, geochemical and spectroscopic analyses, geographical information systems, climate and environmental modeling. We aim to bring scholars working on the development and application of scientific methods and analyses together in these volumes. We also seek to include in these pages recent advances in methodological and theoretical approaches. Your support, contributions and engagement with the archaeological science presented here are crucial to the progress and development of the journal.

Güneş Duru & Mihriban Özbaşaran

Mortuary Behavior in Chalcolithic Anatolia: A View from Gülpınar

Yılmaz Selim Erdal[a], Turan Takaoğlu[b]

Abstract

This work assesses the mortuary behavioral patterns in Chalcolithic Anatolia in the light of recently discovered burial data from the site of Gülpınar in northwestern Anatolia. A total of seven burials unearthed in the Middle Chalcolithic (phase III) occupation at Gülpınar indicate that the dead were deliberately buried on the periphery or just outside the surrounding wall of the settlement, mainly on the walls or in empty spaces between the walls of the preceding phase II structures belonging to the Early Chalcolithic period. The selection of abandoned areas gradually falling out of use on the periphery of the settlement as a burial place relates to social memory; whereby the settlers defined their group identity and linked the deceased with their forefathers. Although the number of burials is admittedly too limited at Gülpınar to reach a firm conclusion, the burial data from the site may demonstrate that male and female adults were buried in the abandoned residential areas or areas being abandoned in the periphery of the settlement, a pattern that has rarely been attested in the archaeological record. However, a high frequency of infants and few adults underneath house floors suggest adults were buried different places.

Keywords: Chalcolithic, Anatolia, bioarchaeology, mortuary behavior, age differentiation

Özet

Bu çalışma kuzeybatı Anadolu Kalkolitik dönem yerleşimlerinden Gülpınar da ortaya çıkarılan mezarların analizinden yola çıkarak Anadolu da bu dönemin ölü gömme davranışlarını değerlendirmeyi amaçlar. Orta Kalkolitik (evre III) Gülpınar yerleşiminde ortaya çıkarılan yedi adet iskelet ölülerin genelde yerleşimin kenarında veya çevre duvarının hemen dışında ya bir önceki Erken Kalkolitik dönemi temsil eden evre II yapılarının duvarları üzerinde ya da duvarlar arasındaki boşluklara bilinçli olarak gömüldüğüne tanıklık eder. Yerleşimin terk edilmiş veya terk

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edilmekte olan alanlarının ölü gömme amaçlı olarak tercih edilmesi bir şekilde halkın yerel kimliklerini tanımlaması ve atalarıyla kurdukları bağların tanımladığı sosyal hafıza ile ilişkili görülebilir. Gülpınar'dan ele geçen mezarların sayısı sınırlı olsa da ele geçen ölü gömme ile ilgili veriler arkeolojik kayıtlarda pek sık rastlanmayan yetişkin erkekler ve kadınlar terkedilen veya terkedilmekte olan alanlara gömüldüğünü gösterebilir. Bununla birlikte, taban altı gömülerinde bebeklerin sıklığı ile az sayıdaki yetişkinler, erişkin bireylerin farklı yerlere gömüldüğünü desteklemektedir.

Anahtar Kelimeler: Kalkolitik, Anadolu, biyoarkeoloji, ölü gömme davranışı, yaşa göre farklılaşma

Introduction

There are various archeological sources regarding the perceptions of belief systems and the afterlife among past communities. Since the deceased were interred and located deliberately, burials constitute one of the most important data sources. Thus, the systematic assessment of data collected from various excavations enable archaeologists to draw inferences about burial customs in prehistoric settlements. An argument often put forward by archeologists and anthropologists regarding the burial customs in prehistoric populations is that the role and status of the individuals play an important part in burial practices, or that burials simply reflect social differences. According to Binford (1971) and Saxe (1970), the treatment of death is reflective of a person's social position, and mortuary analyses therefore reflect social structure, hierarchy and/or status. Hence, the differences and changes in burial customs do not necessarily reflect social change but may be interpreted as part of a wider social practice; the rituals and/or social transformations that constitute communities. It has previously been suggested that mortuary rituals can be regarded as a behavior chosen by actors having a broad perspective and specific beliefs as well as connecting to symbolic themes, rather than being directly reflective of social organizations (Binford 1971; Tainter 1978; Chapman et al. 1981; O'Shea 1984; Kuijt 1996). Variations in mortuary practices reflect the degree of interconnection within and between people on multiple social scales, such as the household, village, or region (Kuijt 2008).

The number of subfloor burials, which were very common during the PPNA and Early PPNB settlements in the Near East, decreased over time. Many of the Late Neolithic settlements do not have enough subfloor burials that would signify these as being representative of their population. This is especially true for the Chalcolithic period (see Erdal 2019a; Balossi-Restelli and Erdal 2019). The Chalcolithic period represents an important step in the cultural history of Anatolia, witnessing significant changes in most aspects of life and material culture. Each sub-region of Anatolia felt these socio-economic and cultural transformations to a different degree. These transformations included changes in settlement organization, developments in technology, the emergence of new pottery forms and styles, a rise in the degree of long-distance

exchange, and the steps taken towards a centralized society particularly towards the late stage of the Chalcolithic period. Assessing the behavioral patterns of the people of this period is one way to get a better picture of these changes and transformations during this crucial transitional period between the Neolithic and the Bronze Ages.

How communities in the Early, Middle and Late periods of the traditional tripartite division of the Chalcolithic period treated their dead has been one of the most curious questions in elucidating the mortuary behaviors adopted by communities in Anatolia. These questions involve many aspects. Where were the dead buried? Were there any social preferences in burying the dead in terms of gender and age? Were internments carried out inside or outside the settlements? What kind of health issues did the Chalcolithic inhabitants of settlements have? What occupations/activities were the deceased involved in during their lifetime? Was there continuity or change between the Chalcolithic and preceding Neolithic burial customs? This study undertakes to answer some of these questions by examining the burials during phase III at Gülpınar in the context of already accumulated mortuary data derived from archaeological excavations conducted in Anatolia.

Gülpınar and the Burial Context

The prehistoric site of Gülpınar, identified beneath the remains of the Greek and Roman Sanctuary of Apollo Smintheus (Smintheion), is located on the outskirts of the synonymous village in the southwestern corner of the Biga Peninsula (ancient Troad) in northwestern Anatolia (Figure 1). Three main occupational phases were identified at Gülpınar. The earliest occupation is phase I representing the Neolithic period. Following a hiatus, the subsequent settlement, phase II, dates to the Early Chalcolithic period and has radiocarbon dates ranging between 5320 and 4940 cal. BCE. The succeeding phase III, the focus of the burials in this study, represents the Middle Chalcolithic period in western Anatolian chronology and dates between 4930 and 4450/4300 BCE. The transitional Middle Chalcolithic period in western Anatolia was clearly an important stage, witnessing a change in most aspects of socio-economic life and cultural pattern, with an increase in population and settlement numbers, adoption of site-location strategies for settlements, developments in technology, and a rise in the degree of cultural interactions and long-distance exchange. Other than Gülpınar, traces of the Middle Chalcolithic cultural horizon have been best documented in the western Anatolian littoral at sites from the Çanakkale region to the northwest and the Antalya region to the southwest (e.g., Sağlamtimur and Ozan 2012; Blüm 2014; Çevik 2018; Derin and Caymaz 2018; Günel 2018; Tuncel and Şahoğlu 2018; Korkut et al. 2018).

Although excavations conducted at Gülpınar identified only seven burials, they are important because they help us to gain information regarding burials customs and the gradual

abandonment of the settlement. This work also assesses the architectural context of the burials and the treatment of the bodies. Three human skeletons were unearthed in Sector 3 (Figure 2), located to the north of the surrounding wall on the periphery of the settlement. In this sector, two of the three burials (Burial 1 and Burial 2) were found around or on the walls of structures representing phase II, while the third was identified inside the debris of phase III close to the surface (Burial 3). The skeletons found in burials 1 and 2 are quite well-preserved compared to Burial 3, which appears to have been disturbed during Roman occupation of the site. All three burials in Sector 3 were found with burial gifts that appear to have been intentionally placed to accompany the deceased. On the other hand, burials 4-7 were excavated in the northwestern part of Sector 1. These burials were all found in the vicinity of the buttressed wall that defines the cluster of buildings in Sector 1 from the north (Figure 3). Three of the burials (4, 6 and 7) were found outside the buttressed wall, while the remaining one (Burial 5) was laid directly on a wall perpendicular to the buttressed wall. The location of Sector 3 only 25 m north of Sector 1 indicates that the burying the dead started in the vicinity of the buttressed wall and extended northwards in the empty spaces and already abandoned buildings.

Basic Data on the Burials

The body in Burial 1, laid upon the walls of a preceding phase II structure, is positioned on its left side with knees pulled up and the hands resting in front of the body (see Table 1, Figure 4). The head of the deceased faces east, and the skeleton is fragmented. One of the distinct features of Burial 1 is that this old adult female was intentionally laid upon a floor formed of beach sand superimposing the stone foundation wall of a preceding phase II structure. Burial 1 contained a complete open-mouthed bowl placed in an upright position in front of the feet (Figure 5a). Besides this bowl, roughly 20 cm. in diameter, Burial 1 also contained objects such as a notched ground stone tool —perhaps a loom weight or fishnet sinker— placed in front of the knees, as well as several small stone beads, flint flakes, and a single piece of Melian obsidian blade found in front of the body.

The bones, represented just by pieces, indicate that the skeleton belongs to an adult female. No longitudinal measurements could be taken due to the badly preserved condition of the skeleton. However, the mental eminence of the mandible and dental remains are well preserved. No caries was observed among the 30 teeth. The maxillary left third molar and mandibular left canine were lost postmortem. According to Brothwell's grades, the attrition score was about 2 and 4+, which demonstrates that attrition was slight (Brothwell 1981). The most severe attrition was observed on the first molars. Small sized dental chippings were seen on both anterior and posterior dentitions. Slightly developed calculi accumulation was observed. These kinds of dental lesions are commonly seen among prehistoric populations. However, compared to

many populations, in which enamel hypoplasia is observed more prominently among anterior dentition, moderate and severe linear enamel hypoplasia was observed on the mandibular and maxillary premolars and molars (Figure 6).

The most intriguing lesion on this individual was observed on the maxillary anterior teeth. The right lateral incisor and central incisors have unusual dental grooves on the incisal edge and lingual surface. The grooves directed buccal to mesiolingual on the distal corner of the incisal edge of the upper lateral incisor were measured as 1.4 mm in width and 3 mm in length. Another groove directed mesiodistally on the lingual surface of the right central incisor and which was close to the cingulum was measured as 1.1 mm in width and 3 mm in length. The groove on the maxillary left central incisor developed on the distal corner of the incisal edge and continued in a distobuccal to mesiolingual direction. These grooves on the incisal edges and lingual surfaces of the maxillary anterior teeth may suggest actions with yarn or cord in textile production, or sinew processing, which might have been passed from one side to the other side of the mouth. This kind of non-alimentary usage of teeth for yarn and cord production is seen in some settlements in Anatolia (Erdal 2008) and in Neolithic settlements in the Marmara region (Alpaslan-Roodenberg 2008, 2011).

In contrast to Burial 1, the deceased in Burial 2 was laid on its right side with knees pulled up and the hands resting in front of the body directly on the virgin soil (Figure 7). The skeleton is almost complete but fragmented like the one in Burial 1. Burial 2 did not contain any gift other than a bowl, which was also placed in front of the feet (Figure 5b). The bowl was initially deposited standing upright but was subsequently slightly tilted when the deceased was covered with earth. The similarities between the bowls in burials 1 and 2 indicate that they represent contemporaneous burials. This is because there is ample evidence from this phase that such bowls that they were typical objects of this period. Radiocarbon analysis of a bone sample taken from the skeleton in Burial 2 provides us with a date to 4500-4455 BCE (Beta-405653). The dating of this skeleton is in accordance with the estimated date for the beginning of the gradual abandonment of the peripheries of the settlement and the remains belong to an old adult female. No pathological changes except severe osteoporosis could be observed on this individual. Burial 2 also contained a bowl with a tab handle roughly 20 cm. in diameter, like the one deposited in Burial 1.

Burial 3, unfortunately, is not preserved as completely as the other two burials found in Sector 3 (Figure 8). It could be deduced from examination of the bones that the deceased was laid on its right side with knees pulled up and the hands resting in front of the body in a position comparable to that of Burial 1. Despite being broken, a nearly complete bowl with uprising handles accompanied by a jug with one uprising handle was found over the chest of the skeleton (Figure 5c). The third pottery vessel included in this burial is a high-footed bowl found in a subsided

position near the feet. In addition, the base of a conical marble rhyton was also recorded near the head of the skeleton. A fragment of a bone taken from the skeleton was also subjected to a radiocarbon dating (Beta-405654). The 4315-4180 BCE date obtained for this bone sample, found during the final year of excavation in 2013, is the latest radiocarbon date to have been found at Gülpınar.

Table 1. Tabulation of human skeletons from phase III burials at Gülpınar.

Burial	Location	Sex*	Age*	Age Group	C-14 Dating (1σ)	Disease
1	Sector 3 Grid H12	Female	-	Old Adult	4500-4455 BCE (Beta-405653)	Dental grooves
2	Sector 3 Grid H12	Female	-	Old Adult	-	Severe osteoporosis
3	Sector 3 Grid H12	Male	-	Unknown Adult	4315-4180 BCE (Beta-405654)	Osteoporosis
4	Sector 1 Grid L11	Male	-	Unknown Adult	-	Slight osteoarthritis Non-specific infectious Treponemal disease
5	Sector 1 Grid L12	Male?	-	Unknown Adult	4675-4545 BCE (Beta-405655)	Fracture on a rib Lateral epicondylitis (Tennis elbow)
6	Sector 1 Grid L12	Male?	-	Unknown Adult	-	Infection on the distal end of tibia
7	Sector 1 Grid K11	Male	35-39 years old	Middle Adult	-	Dental notch, LSAMAT, dental caries, AMTL, tooth fracture, severe dental attrition

*Age and sex of the individuals were determined by standard data collection procedure (Buikstra and Ubelaker 1994).

The skeleton in Burial 3 belongs to an adult male whose age at death is unknown. Although the condition of the skeleton is not as good as the first two skeletons in this sector, fragmented post-cranial bones and a few cranial elements were analyzed. No caries were found on the teeth eight. Slightly developed attrition (from 2 to 4), hypoplasia and dental calculi were observed on the teeth.

Excavations conducted in Sector 1, located 20 m south of Sector 3, also yielded four primary burials and an additional twenty isolated bone remains. Among these, the human skeleton found in Burial 4 is possibly an adult male with unknown age at death. Only the lower

extremities were preserved. Severe subperiosteal new bone apposition was detected all around the diaphysis of the femora and the anterior and lateral surfaces of the tibia, and all around the fibulae. Moreover, infectious lesions were observed on the dorsal surface of the ilium, especially around the acetabulum on the right coxae. However, the infection on the tibia is more severe than on the other bones (Figure 9). Active periostitis is more severe around the muscular attachment areas. The external surface of the preserved long bones showed strong vascular impressions and raised plaques of new bone appeared to bridge over them, specifically in the most affected area of these bones. Postmortem fractured areas of bones show a stratified, or onion shaped structure which is commonly seen in treponemal diseases (Rothschild and Rothschild 1995; Rissech et al. 2013). However, it is not possible to diagnose the treponemal disease without other bones, especially skull and post-cranial bones.

The skeleton in Burial 5 was found next to the interior face of the buttressed wall. This skeleton, which belonged to a male individual, was laid directly upon the wall of a phase II structure. Radiocarbon analysis of a bone sample taken from this skeleton provided us with a date around 4675-4545 BCE (Beta-405655). The contemporaneity of Burial 5 revealed in Sector 1 with Burial 2 found in Sector 3 may indicate that both males and females were buried simultaneously in either already abandoned parts or areas gradually being abandoned in the peripheries of the settlement, indicating that both sexes received the same treatment during this period.

Excavated remains in Burial 5 consist of a fragmented left rib, right arm bones, and lower extremities. This skeleton belongs to an adult male individual. Only the epicondylitis (or tennis elbow) on the right lateral epicondyle and a healed fracture with slight distortion on the angulus costalis of a single preserved rib were observed. Tennis elbow, defined as enthesopathies on the lateral epicondyle, is accepted as an enthesis related to flexion, extension, and pronation of the forearm (Figure 10). The age of the individual could be the reason for the development of tennis elbow. This pathology as an occupational stress marker is important for the assessment of activity patterns in past populations (Spigelman et al. 2012). Studies on present day individuals show that repetitive or forceful tasks create the risk of epicondylitis (Marklin and Monroe 1998; Pascarelli and Hsu 2001). It is not possible to determine the reason behind this lesion on the individual however, as there is a close relation between epicondylitis and daily activities such as yarn and textile production, meat processing, woodcutting, shoemaking, and glassblowing (Werner et al. 2005; Spigelman et al. 2012), where workers undertake repetitious or vigorous tasks.

The skeleton excavated in Burial 6, which was found on the open space near a stone-built small platform to the north of the buttressed wall, consists of only the right femora, and both lower legs. An active infectious lesion was observed on the interosseal surface of the distal end of the left tibia.

The skeleton in Burial 7, also found just in front of the buttressed wall, consists of a cranium, jaws, teeth, and some bones of the lower extremities. Only a slight periosteal reaction on the proximal end of the right tibia was observed. However, some dental pathologies were detected. A mesiobuccal-distolingual directed notch measuring 3.7 mm in width was observed on the maxillary right canine (Figure 11). This unusual notch associated with non-alimentary purposes might be related to biting a hard substance such as wood as a pincer during basket processing (Hillson 1996; Anderson 2002), which is different from the skeleton found in Burial 1. Moreover, all maxillary anterior dentition from the right lateral incisor to the left canine have lingual surface attrition (LSAMAT) LSAMAT, as a specific type of attrition on the lingual surface of maxillary teeth, is related to sucking some foods (see Turner and Machado 1983; Irish and Turner 1987). Beside these, severe abrasions (grade 5) are present on the incisors. In contrast, attrition on the posterior dentition is slight and moderate (grades 3-4). The mandibular right first premolar was broken premortem and as periapical abscess developed in relation to this dental fracture (Figure 12).

While the other teeth have small and medium-sized chippings, a large enamel piece has flaked from the mandibular right second premolar which is a neighbor of the fractured tooth. Maxillary second premolars on the same side were also lost antemortem. In addition to these lesions, caries possibly related to dental trauma were observed on the maxillary right first molar. Slightly developed dental calculus, periodontal disease, and enamel hypoplasia on the anterior dentition can be counted as other dental pathologies of the skeleton in Burial 7.

Each of the seven skeletons found in the single primary burials at Gülpınar belong to adults. The two skeletons found in Burial 1 and Burial 2 in Sector 3 belong to females. The third skeleton found in Sector 3 and the four from Sector 1, on the other hand, belong to males. Additionally, 20 isolated bones scattered around the excavated area —fragments of four femora, one fibula, one tibia, one calcaneus, one radius, five phalanges, four cranial fragments, and three mandible fragments with nine teeth— also belong to male and female adults.

Discussion of Evidence

Bioarchaeological Data

It should be noted that these skeletal remains are insufficient to reconstruct and interpret the bioarchaeological aspects of the Middle Chalcolithic Gülpınar community due to their poor condition and incompleteness. However, dental remains suggest both male and females used their teeth, especially anterior teeth for non-alimentary purposes. Although the male has only a single tooth with a notch, one woman has three teeth with aberrant wear. Anthropological studies on dental remains among Anatolian prehistoric peoples suggest usage of the teeth as a third hand

was very frequent in the PPNA (Körtik Tepe) and PN (Hakemi Use and Bademağacı) groups, but it decreased with time and only a few individuals of the Late Chalcolithic and Early Bronze Age (Arslantepe, İkiztepe) have unusual abrasions (Erdal, under review). However, only women in these Late Neolithic and Chalcolithic people have grooves on their teeth and males have either LSAMAT or notches on their anterior teeth. This suggests an increased sex difference on tooth tool usage in Anatolia. Unusual abrasions in northwestern Anatolia are common and they are frequently found among females, reflecting gender-based labor differences (see Alpaslan-Roodenberg 2008, 2011; Erdal 2008, under review). They could use their anterior teeth during yarn production and to weave materials such as textiles, rugs, and mats. Epicondylitis also supports the yarn and textile production hypothesis (see also Spigelman et al. 2012). This was clearly the case at Chalcolithic Gülpınar. Although there is no actual evidence, such as a piece of woolen cloth or thread made of wool during the archaeological excavations of the Chalcolithic phases at Gülpınar, there is a wealth of indirect evidence regarding weaving activities at the site. Negative impressions observed on over a thousand pot bases from phases II and III at Gülpınar prove that weaving could have been a common domestic craft activity at the site alongside mat making and basketry. In addition, the large number of spindle whorls, pierced pot-sherd disks, stone weights, and bone implements recovered during excavations could also be associated with household weaving being carried out at the site (Takaoğlu and Özdemir 2018).

Other bone lesions such as osteoporosis and osteoarthritis are reflections of normal results of aging and metabolism (Ortner 2003). However, if the diagnosis is true, Gülpınar is the earliest case of treponematosis in the old world. However, the genetic makeup of the population and infectious diseases will be evaluated after aDNA examination of the bones at the HUMAN -G laboratory at Hacettepe University in Ankara.

Bioarchaeological results suggest limited information about daily life and biocultural adaptation of the population. However, even though the number of skeletons is limited, the burials give more detailed and invaluable information about the burial customs of the Chalcolithic people.

Mortuary Behavior

From Subfloors to Abandoned Peripheries

Available mortuary data from the Late Neolithic and Chalcolithic periods in Anatolia reveals a pattern of gradual transition from subfloors to the peripheries in the close vicinity of the settlements. Information about Late Neolithic burials comes mostly from subfloor burials. Compared to Early Neolithic sites, the number of subfloor burials is small and many of them

are represented by subadults, especially infants. For instance, all eleven subfloor burials from Salat Camii Yanı, one of the PN settlements in Anatolia, belong to infants except for one child (Miyake 2008, 2010). In burials at Hakemi Use, 57.9% out of 95 individuals (Erdal 2013), in Bademağacı, a Neolithic settlement in the Lakes Region, 60.4% of 44 individuals (Erdal 2009, 2019b), and 64.6% of the 48 individuals found in Ilıpınar (Alpaslan-Roodenberg 2008) belong to infants and children. Representation of subadults shares almost the same frequency as at Tell Sabi Abyad in northern Syria, which has a very similar cultural pattern to Hakemi Use in southeastern Turkey (Smits and Akkermans 2009; Akkermans 2008) and Tell Ain el-Kerkh in Syria (Hudson et al. 2003). In the first excavation season at Tell es-Sawwan, 13 adults, 71 subadults and 55 infants were found (Campbell 1995). It should be mentioned that almost all these human remains, except at Ilıpınar, represent subfloor/indoor burials.

Actual mortuary data also reveal that representation of subadult individuals unearthed beneath the houses in PN settlements, especially of individuals under the age of one, has more than doubled, reaching up to 60%. Moreover, almost all the remains, consisting over 200 individuals from the Late Neolithic and Early Chalcolithic levels of Köşk Höyük belong to infants (Öztan 2012; Erdal, personal communication, 2013; Özbek and Erdal 2006). Infant remains, mostly under aged less than one year, were excavated within settlements beneath the walls or floors. In Köşk Höyük, where some individuals were interred outside the houses under the eaves (Öztan 2012), only 6 individuals represent adults, and they are mostly females (Öztan 2012; Özbek 2009a, 2009b).

A similar age-based differentiation has also been attested in the Chalcolithic Anatolian sites. Of the 18 skeletons at Çavi Tarlası, recovered mostly from simple graves within the settlement only two are adults (von Wickede and Mısır 1986). At Değirmentepe, almost all the 32 human remains (96.9%) are subadults, ranging from fetuses to juveniles, in the Ubaid layers (Özbek 2001; Özbek and Erdal 2006). Of the 37 individuals from Arslantepe located near Değirmentepe, dating back to Late Uruk Period, 59.5% are perinatal and infants. Only 12 belong to adults, especially females (10 women). Bıçakçı et al. (2012) suggest that there is considerable variability in the Early Chalcolithic burial practices at Tepecik-Çiftlik; indoor inhumations are rare and are confined generally to newborn babies. These graves are simple pits in open areas. They (Bıçakçı et al. 2012) propose that burials encroaching upon common open areas were kept inside in the privacy of the households. At Bakla Tepe, representing the Late Chalcolithic of western Anatolia, no adult remains were retrieved (Erdal unpublished data; Erkanal and Özkan 1999). 26 individuals from Çamlıbel Tarlası Höyük (Late Chalcolithic) included 20 infants and children, and 14 of them were younger than six years old (Irvine 2011). (No adult individual was found in Late Chalcolithic layers at Çadır Höyük (Erdal 2019a).

All these data suggest that the Late Neolithic and Chalcolithic communities had different customs of burying their dead. There is a clear decrease in the number of indoor or subfloor burials, as well as an increased ratio of subadults to adults, and differences in the proportion of females to males. Some researchers explained these differences as due to increased subadult mortality in the Chalcolithic period in Anatolia, where subadults, especially infants, were buried in different areas, such as at Köşk Höyük (Öztan et al. 2009), Değirmentepe (Özbek 2001; Özbek and Erdal 2006), Bakla Tepe (Erkanal and Özkan 1999), Çavi Tarlası (von Wickede and Mısır 1986). This factor cannot be explained by morbidity or mortality because there are few or no adult individuals buried in these settlements.

The Case of Gülpınar

Although the number of skeletons is low at Gülpınar, available human remains suggest that individuals were mainly adults and the sex distribution of these burials is in accordance with the general pattern representing the late Neolithic periods in Anatolia. The phase III settlement at Gülpınar, which represents the Middle Chalcolithic period (4900-4300 BCE) in western Anatolian chronology, is one of those sites where we encounter mortuary evidence particularly in old habitation areas or on the periphery of the settlement, just beyond the surrounding wall (Takaoğlu and Özdemir 2018). The new data from Gülpınar may also be significant in establishing that the burying of adults in the former habitation or disused areas of the settlements was part of an abandonment ritual, a pattern that has not been frequently attested in the archaeological record. Furthermore, the burial of male adults at Gülpınar is in contrast with the general pattern in which mostly females and infants were buried inside or around the habitation areas.

The deliberate re-use of abandoned parts of settlements as a burial place is an issue that has been little investigated in the archaeological record of prehistoric Anatolia. Although the seven burials at Gülpınar alone cannot represent enough data to make explicit statements about this burial custom that is only sporadically attested in the archaeological record, the context of the available burials at the settlement allow us to offer some thought on the subject. The reason behind the use of old habitational areas as a burial place may have been symbolic in nature, resulting perhaps from a desire of settlers to associate themselves with the former population of the settlement and to establish an emotional connection to their predecessors.

There is somewhat-related archaeological evidence from the site of Aktopraklık in Early Chalcolithic northwestern Anatolia showing the use of abandoned settlements as a burial place. The settlement of Aktopraklık C was used as a burial place after settlers moved to Aktopraklık B

(Karul and Avcı 2011, 2; Lichter 2016, 79). However, mortuary evidence from Gülpınar shows that the Middle Chalcolithic inhabitants gradually began to use the abandoned buildings located at the fringe of their settlement, as well as open spaces outside the buttressed surrounding wall, as burial places towards the end of the phase III settlement.

In addition to Gülpınar and Aktopraklık, mortuary remains from Kumtepe A, Uğurlu III and Ege Gübre II also enhance our understanding of the mortuary behavior prevailing in the Chalcolithic of western Anatolia. At Kumtepe, two burials (R1 and R2) were found side by side in a shallow oval pit cut in the bedrock in Trench R of phase A1 and the third (U1) in a shallow with hollowed in the earth in Trench U in phase A2 (Sperling 1976, 311 and 326). Each of these burials preserved skeletons representing female adults buried in a contracted position, slightly on their right side. The area in which these burials R1 and R2 was just outside the settlement at Kumtepe (Sperling 1976, 311). These burials could be accepted as more-or-less contemporary with the ones from Gülpınar when one considers the close similarities between the material remains with which they are associated at both sites. In particular, the marble bowl placed under the chin of the deceased in Burial R1, perhaps as a burial gift, has nearly identical parallels with phase III of Gülpınar.

The burial pit containing 12 skeletons, identified in the courtyard of a communal building at Uğurlu on the island of Gökçeada (Imbros), is another case in the region. This burial pit dated to ca. 5300 BCE can be synchronized roughly with the beginning of the phase II settlement at Gülpınar. Throwing the dead purposely in a single pit rather than placing them more carefully is thought to be part of a local burial custom related to ceremonial sacrifice at Uğurlu (Boz and Erdoğu 2019, 5).

Excavations conducted at Ege Gübre in central western Anatolia, on the other hand, reveal significant evidence regarding the burial of dead outside the settlement. At Ege Gübre, the Chalcolithic burial from phase II at the site contains five skeletons of adults extending in a contracted position (M1-M2, M4-M6) and an additional new-born baby in a jar as the sixth burial (M3) (Yazıcı 2009, 55-57; Sağlamtimur and Ozan 2012, 228). The five adults were buried in shallow pits dug into the earth, some of which were lined with rubble on all sides. Among these five adults, one was reported to belong to a male of 30-35 years old (M4) and two represented females (M5-M6). The remaining two undefined skeletons, the sex of which was not reported, could have also belonged to female adults as the personal ornaments found with them indicate. The recovery of these burials among the remains of Neolithic occupational layers seems to indicate that the actual settlement was within a close vicinity and the deceased were deliberately buried here for some reason. Because we do not know whether there was an archaeological stratum attesting to continuity from the Neolithic to Chalcolithic period in the

other, unexcavated, parts of the site, we cannot explicitly state on whether the Chalcolithic inhabitants also incorporated the custom of burying their dead in formerly occupied parts of the settlement in their mortuary behavior.

At Gülpınar, burial grounds were used solely for adult individuals, a pattern that has already been attested at other Chalcolithic sites such as Aktopraklık (Alpaslan-Roodenberg 2011; Karul and Avcı 2013), as well as Ilıpınar (Alpaslan-Roodenberg 2008) and Pendik (Pasinli et al. 1994; Özdoğan 2013). Alpaslan-Roodenberg and Roodenberg (2020) have published 83 individuals from Aktopraklık and, only two of them belong to infants. Total subadults do not reach to 20%. Aktorpaklık Early Chalcolithic cemetery do not contained infants. At Barçın Höyük, a total of 72 indviduals were analazyed by Alpaslan-Roodenberg and Roodenberg (2020). A huge amount of subadults (29 individuals) were perinatal individuals. Infants were mostly buried under the floors of the houses, but adults were found in the courtyards of these structures. Roodenberg and Alpaslan- Roodenberg (2013, 75) explain "…Neolithic and Early Chalcolithic communities buried their dead in or near the village ground. This may be at the edge of the settlement, as was the case of Ilıpınar…, in built-up plots as shown at the basal layers of Menteşe, or in a separate area – a cemetery outside the village, as was demonstrated by Early Chalcolithic Aktopraklık."

The site of Gülpınar was apparently more-or-less part of this tradition, in which infants and some adult females were buried inside the living structures, while other adults were either buried in extramural cemeteries not far from the settlements, buried in courtyards, or buried in the ruins of the abandoned buildings of a settlement. However, the houses related the adult individual burials were not excavated, and no infant burials were found with adults.

Although only a few of the human skeletons in these burials were found complete at Gülpınar, the state of the preserved bones shows that the main custom was to bury the deceased in a contracted position. The position of the legs and remaining parts of the arms show that the deceased was deliberately placed in a contracted position, as indicated by the well-preserved skeletons in burials 1, 2 and 5. Poor preservation of the skeletons in burials 3, 4, 6 and 7 was apparently due to activities carried out in the Roman period in this part of the settlement. As a result, the skeletons in burials 4-7 contained no identifiable burial gifts due to their deficient state of preservation.

The placement of pottery vessels near the feet of the skeletons in burials 1 and 2, as well as two on the chest of a skeleton in Burial 3 may have been either a sign of certain belief in the afterlife or a reflection of the ritualized funerary meal. Those pottery vessels uncovered intact in burials 1 and 2 containing female adults at first glance leads one to assume that this behavior was gender oriented. Nevertheless, the three pottery vessels uncovered in association with a male adult in Burial 3 shows that there was no distinction between genders in the deliberate placement of

pottery vessels in burials. The only difference is that in Burial 3, a large bowl with uprising handles and a jug with uprising handle was found in a position covering the chest of the skeleton, in addition to a high-footed bowl found in a subsided state near the feet. No sign was found of the intentional smashing of pots in burials being practiced at Gülpınar. Although the deliberate deposition of objects in specific parts of the burials by the mourners was part of a funerary ritual (Pearson 1999, 54) it is not easy to give a meaning to the deposition of the bowls near the feet of the deceased at Gülpınar.

The pottery in burials in Gülpınar burials do not appear to be objects that could specifically be built to accompany the deceased, but rather were mundane objects associated with daily activities which were found in great quantities in the residential units throughout the site. It can be presumed in this sense that the pottery vessels of utilitarian character were used for the last time during the funerary rituals and subsequently placed in specific parts of the burials by the mourners.

Previously, it was argued elsewhere that funerary rituals at Gülpınar may have involved figural pottery vessels with anthropomorphic representations that may have depicted mourning individuals (Takaoğlu 2006, 306; Takaoğlu and Nanoglou, in press). There are two examples of such figural vessel fragments at Gülpınar, one represented by a human protome and the other by a handle in the form of a human head. Both vessels have incised vertical stripes on their cheeks of the faces, indicating tears or scratches. Additional six human protomes from other figural pottery vessels were also at Gülpınar. The common feature of these total of eight figural pottery vessels is that mouths were not marked for a symbolic reason. Although these pieces were not found in relation to a mortuary context to confirm their use in funerary rituals, such figural vessels may be viewed as objects of funerary rituals.

In contrast to the three burials unearthed in Sector 3, no finds that could be designated as burial offerings, possessions of the deceased during life, objects that would serve the dead in the hereafter, or items of funerary rituals were found in burials 4-7 in Sector 1, due in part to their state of preservation.

Gülpınar is also a place where the change observed in the mortuary behavioral pattern involving the location of burial places in relation to the settlements in Chalcolithic Anatolia can be observed. The emerging new pattern here is centered to a great extent on the custom of burying the dead just outside the settlement, using either abandoned parts of the dwellings or areas that are falling out of use on the peripheries. At Gülpınar, this custom shows no variability between genders, as both male and female adults receive the same treatment. It is, however, difficult to state that all the dead were subjected to similar treatment during this period, since the burials discovered so far represent only a small part of the actual population size. It is reasonable to assume from the context of few burials with finds that burying the dead among abandoned

dwellings or areas gradually falling out of use on the peripheries of the settlement may have been an activity practiced at a family or individual level, and not necessarily involved a large social group or the entire community.

Both ethnographic and archaeological record indicates that mortuary rituals were places in which dead are mourned, social memories are created, and local identities and group memberships are claimed (Cannon 1989; Chesson 2001). A study conducted on the various aspects of the mortuary customs of the Andean communities represents a special case showing how the commemoration of the dead in funerary rituals help to establish links between the living and the dead in physical monuments and memories associated with the individuals (Dillehay 1993). Available mortuary evidence from Anatolia demonstrates that the intertwining of the living with the dead was also the case in the funerary rituals taking places in parts of the settlements that presents the memories of the past. It is possible that, in Anatolia, certain adults were specially chosen for this mortuary behavior.

Conclusions

The contribution of the mortuary data from Middle Chalcolithic Gülpınar is twofold. Firstly, the location of the burials either in already-abandoned habitational areas or architectural spaces that gradually fell out of use on the periphery of the settlement or just beyond the surrounding wall delineating the core of the settlement from its immediate surroundings is a phenomenon that is not often visible in the archaeological record. This deliberate use of domestic spaces holding memories of the past as burial places was probably a gesture of remembrance associated with social memory, in which the settlers defined their group identity and linked them with their ancestors and the past. By doing so, the Middle Chalcolithic inhabitants of Gülpınar may have placed themselves under the protection of the former occupants of the settlement. Although one needs to be cautious in formulating hypotheses about the engagement of past populations with their forebears, information derived from the mortuary data often provides insights on this matter. Abandoned areas or areas gradually falling out of use in terms of the history of the settlement at Gülpınar could be viewed as places where the worlds of the living and the dead interacted.

Secondly, the analysis of available mortuary data from Gülpınar allows us to conjecture that there may have not been a major distinction in the treatment of both male and female adults in the Chalcolithic period but was an important differentiation with respect to the age-at-death of the individuals. Infants and small children were buried in the housing area as subfloor burials, while adults, especially males, were buried in the ruins of abandoned areas, courtyards and/or extramural cemeteries during this period in Anatolia.

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References

Akkermans, P. M. M. G. 2008. Burying the Dead in Late Neolithic Syria. J. M. Córdoba, M. Molist, M. C. Pérez, I. Rubio, S. Martínez (Eds.), *Proceedings of the 5th International Congress on the Archaeology of the Ancient Near East*, Madrid, 621-646.

Alpaslan-Roodenberg, S. 2008. The Neolithic Cemetery: The Anthropological View. J. Roodenberg, S. Alpaslan-Roodenberg (Eds.), *Life and Death in A Prehistoric Settlement in Northwest Anatolia. The Ilıpınar Excavations,* Volume 3. Leiden: Peeters, 35-68.

Alpaslan-Roodenberg, S. 2011. A Preliminary Study of the Burials from Late Neolithic-Early Chalcolithic Aktopraklık. *Anatolica* 37, 17-43.

Alpaslan-Roodenberg, S., Roodenberg, J. 2020. In the Light of New Data: The Population of the first Farming Communities in the Eastern Marmara Region. *Praehistorische Zeitschrift* 95, 48-77.

Anderson, T. 2002. Unusual Dental Abrasion from Medieval Kent. *British Dental Journal* 192, 2.

Balossi-Restelli, F., Erdal, Y. S. 2019. Late Chalcolithic Burials and Funerary Rituals. F. Balossi-Restelli (Ed.), *Arslantepe. Period VII. The Development of a Ceremonial/Political Centre in the First Half of the Fourth Millenium BC (Late Chalcolithic 3–4)*. Roma, Arslantepe Series 2, 225-262.

Bıçakçı, E., Godon, M. Y., Çakan, G. 2012. Tepecik-Çiftlik. M. Özdoğan, N. Başgelen, P. Kuniholm (Eds.), *The Neolithic in Turkey: New Excavation and New Research. Central Turkey 3*. Istanbul: Arkeoloj ve Sanat Yayınları, 89-134.

Binford, L. 1971. Mortuary Practices: Their Study and Their Potential Source. L. R. Binford (Ed.), *Approaches to the Social Dimensions of Mortuary Practices*. Memoirs of the Society for American Archaeology, No. 25, 6-29.

Blüm, S. W. E. 2014. The Middle Chalcolithic Cultural Sequence of the Troad (Northwest Anatolia): Chronological and Interregional Assessment. B. Horejs, M. Mehofer (Eds.), *Western Anatolia before Troy Proto-Urbanisation in the 4th Millennium BC?.* Vienna: Austrian Academy of Sciences Press, 125-156.

Boz, B., Erdoğu, B. 2019. A Sixth-millennium BC Burial Pit at Uğurlu on the Island of Gökçeada. *Antiquity* 93, 1-5.

Brothwell, D. R. 1981. *Digging up Bones. The Excavation, Treatment, and Study of Human Skeletal Remains*. New York: McMillan Company.

Buikstra, J. E., Ubelaker, D. 1994. *Standards for Data Collection from Human Skeletal Remains*. Fayetteville, Arkansas Archaeological Survey.

Campbell, S. 1995. The Archaeology of Death in the Ancient Near East. S. Campbell, A. Green (Eds.), *Death for the Living in the Late Neolithic in North Mesopotamia*. London: Museum of London Archaeology, 29-34.

Cannon, A. 1989. Historical Dimensions in Mortuary Expressions of Status and Sentiment. *Current Anthropology* 30, 437-458.

Chesson, M. S. 2001. Social memory, identity, and death: An introduction. M. S. Chesson (Ed.), *Social Memory, Identity, and Death: Anthropological Perspectives on Mortuary Rituals*. Arlington: American Anthropological Association, 1-11.

Çevik, Ö. 2018. What Follows the Late Neolithic Occupation in Central-Western Anatolia? A view from Ulucak?. S. Dietz, F. Mavridis, Z. Tankosic, T. Takaoğlu (Eds.), *Communities in Transition: The Circum-Aegean Later Neolithic Stage (ca. 5000/4800-3200/3000 BC*. Oxford: Oxbow, 506-512.

Derin, Z., Caymaz, T. 2018. The Chalcolithic Period at Yeşilova Höyük. S. Dietz, F. Mavridis, Z. Tankosic, T. Takaoğlu (Eds.), *Communities in Transition: The Circum-Aegean Later Neolithic Stage (ca. 5000/4800-3200/3000 BC)*. Oxford: Oxbow, 499-505.

Dillehay, T. D. 1993. (Ed.) *Tombs for the Living: Andean Mortuary Practices.* Washington, D.C.: Dumbarton Oaks.

Erdal, Y. S. 2008. Occlusal Grooves in Anterior Dentition Among Kovuklukaya Inhabitants (Sinop, Northern Anatolia, 10th Century AD). *International Journal of Osteoarchaeology* 18, 152-166.

Erdal, Y. S. 2009. Bademağacı Erken Neolitik İnsanları. *Arkeometri Sonuçları Toplantısı* 24, 97-117.

Erdal, Y. S. 2013. Life and Death at Hakemi Use. R. Bernbeck, P. M. M. G. Akkermans, J. Rogasch (Eds.). *Interpreting the Late Neolithic of Upper Mesopotamia*. Turnhout: Brepols Publishers, 213-223.

Erdal, Y. S. 2019a. Interpreting Subadult Burials and Head Shaping at Çadir Höyük. *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 7, 379-385.

Erdal, Y. S. 2019b. An Evaluation of the Demographic Structure of the Neolithic People at Bademağacı Höyük from a Biocultural Perspective. R. Duru, G. Umurtak (Eds.), *Excavations at Bademağacı Höyük I: The Neolithic and Early Chalcolithic Settlements*. Istanbul: Ege Yayınları, 89-111.

Erdal, Y. S. under review. Tooth as a Tool: Activity Induced Dental Abrasion in Prehistoric Anatolia. Tooth as a Tool in Prehistoric Anatolia. *Paleorient*.

Erkanal, H., Özkan, T. 1999. Bakla Tepe Kazıları. H. Erkanal, T. Özkan (Eds.), *Tahtalı Barajı Kurtarma Kazısı Projesi*. İzmir: Kültür Bakanlığı, 12-42.

Günel, S. 2018. Prehistoric Culture in Çine-Tepecik Höyük and its Contribution to the Archaeology of the Region. S. Dietz, F. Mavridis, Z. Tankosic, T. Takaoğlu (Eds.), *Communities in Transition: The Circum-Aegean Later Neolithic Stage (ca. 5000/4800-3200/3000 BC)*. Oxford: Oxbow, 541-550.

Hillson, S. 1996. *Dental Anthropology*. Cambridge: Cambridge University Press.

Hudson, M. J., Dougherty, S. P., Tsuneki, A., Hydar, J. 2003. Neolithic Human Burials from Tell Ain el-Kerkh, Northwest Syria. Antiquity 77 /295. http://antiquity.ac.uk/projgall/hudson/hudson.html (accessed: 05.02.2011).

Irish, J. D., Turner, C. G. 1987. More Lingual Surface Attrition of the Maxillary Anterior Teeth in American Indians: Prehistoric Panamanians. *American Journal of Physical Anthropology* 73, 209-213.

Irvine, B. J. 2011. A Study of the Dentition from the Late Chalcolithic Site of Çamlıbel Tarlası, North Central Anatolia. University of Edinburg, Unpublished Master Dissertation.

Karul, N., Avcı, M. B. 2011. Neolithic Communities in the Eastern Marmara Region: Aktopraklik C. *Anatolica* 37, 1-15.

Karul, N., Avcı, M. B. 2013. Aktopraklık. M. Özdoğan, N. Başgelen, P. Kuniholm (Eds.), *The Neolithic in Turkey. Marmara Basin.* Volume *5*, Istanbul: Arkeoloj ve Sanat Yayınları, 45-68.

Korkut, T., Işın, G., Takaoğlu, T. 2018. Cave habitations in Lycia. The Case of Tavabaşı near Tlos. S. Dietz, F. Mavridis, Z. Tankosic, T. Takaoğlu (Eds.), *Communities in Transition: The Circum-Aegean Later Neolithic Stage (ca. 5000/4800-3200/3000 BC)*. Oxford: Oxbow, 548-55.

Kuijt, I. 1996. Negotiating Equality through Ritual: A Consideration of Late Natufian and Pre-Pottery Neolithic A Period Mortuary Practices. *Journal of Anthropological Archaeology* 15, 313-336.

Kuijt, I. 2008. The Regeneration of Life: Neolithic Structures of Symbolic Remembering and Forgetting. *Current Anthropology* 49, 171-197.

Lichter, C. 2016. Burial customs of the Neolithic in Anatolia. An Overview. Ü. Yalçın (Ed.), *Anatolian Metal VIII. Anatolien und seine Nachbarn vor 10.000 Jahren Anatolia and neighbours 10.000 years ago*. Bochum: Bargbau Museum, 71-84.

Marklin, R. W., Monroe, J. F. 1998. Quantitative Biomechanical Analysis of Wrist Motion in Bonetrimming Jobs in the Meat Packing Industry. *Ergonomics* 41, 227-237.

Miyake, Y. 2008. 2006 Yılı Diyarbakır, Salat Camii Yanı Kazısı. *Kazı Sonuçları Toplantısı* 29, 211-222.

Miyake, Y. 2010. 2008 yılı Diyarbakır İli, Salat Camii Yanı Kazısı. *Kazı Sonuçları Toplantısı* 31, 435-450.

Ortner, D. J. 2003. *Identification of Pathological Conditions in Human Skeletal Remains*. San Diego: Academic Press.

Özbek, M. 2001. Cranial Deformation in a Subadult Sample from Değirmentepe (Chalcolithic, Turkey). *American Journal of Physical Anthropology* 115, 238-244.

Özbek, M. 2009a. Köşk Höyük (Niğde) Neolitik Köyünde Kil Sıvalı İnsan Başları. *Edebiyat Fakültesi Dergisi* 26, 145-162.

Özbek, M. 2009b. Remodeled Human Skulls in Köşk Höyük (Neolithic age, Anatolia): A New Appraisal in View of Recent Discoveries. *Journal of Archaeological Science* 36, 379-386.

Özbek, M., Erdal, Ö. D. 2006. Anadolu'nun Bazı Neolitik ve Kalkolitik Topluluklarında Bebek Ölümleri ve Olası Nedenleri. *Türk Arkeoloji ve Etnografya Dergisi* 6, 41-52.

Özdoğan, M. 2013. Neolithic Sites in the Marmara Region: Fikirtepe, Pendik, Yarımburgaz, Toptepe, Hoca Çeşme, and Aşağı Pınar. M. Özdoğan, N. Başgelen, P. Kuniholm (Eds.), *The Neolithic in Turkey. Marmara Basin,* Volume 5*,* Istanbul: Arkeoloji ve Sanat Yayınları, 167-269.

Öztan, A. 2012. A Neolithic Settlement in Niğde-Bor Plateau", M. Özdoğan, N. Başgelen, P. Kuniholm (Eds.) *The Neolithic in Turkey: New Excavation and New Research. Central Turkey.* Volume 3, İstanbul: Arkeoloji ve Sanat Yayınları, 31-70.

Öztan, A., Açıkgöz, F., Arbuckle, B. S. 2009. 2007 Yılı Köşk Höyük Kazıları. *Kazı Sonuçları Toplantısı* 30, 311-328.

Pascarelli, E. F., Hsu, Y. P. 2001. Understanding Work-Related Upper Extremity Disorders: Clinical Findings in 485 Computer Users, Musicians, and Others. *Journal of Occupational Rehabilitation* 11, 1-21.

Pasinli, A., Uzunoğlu, E., Atakan, N., Girgin, Ç., Soysal, M. 1994. Pendik Kurtarma Kazısı. *Müze Kurtarma Kazıları Semineri* 4, 147-163.

Pearson, M. P. 1999. *The Archaeology of Death and Burial*. Phoenix Mill: Sutton Publishing.

Rissech, C., Roberts, C., Tomás-Batlle, X., Tomás-Gimeno, X., Fuller, B., Fernandez, P. L., Botella, M. 2013. A Roman Skeleton with Possible Treponematosis in the North-East of the Iberian Peninsula: A Morphological and Radiological Study. *International Journal of Osteoarchaeology* 23, 651-663.

Roodenberg, J., Alpaslan-Roodenberg, S. 2013. Ilıpınar and Menteşe: Early Farming Communities in the Eastern Marmara. M. Özdoğan, N. Başgelen, P. Kuniholm (Eds.) *The Neolithic in Turkey. Marmara Basin* 5, İstanbul: Archaeology and Art Publications, 69-91.

Sağlamtimur, H., Ozan, A. 2012. Ege Gübre Neolitik Yerleşimi. A. Çilingiroğlu, Z. Mercangöz, G. Polat, (Eds.), *Ege Üniversitesi Arkeolojik Kazıları*, İzmir, 223-241.

Saxe, A. A. 1970. Social Dimensions of Mortuary Practices. University of Michigan, PhD Dissertation.

Smits, E., Akkermans, P. M. M. G. 2009. Mortuary Practices, Demography and Health: The Late Neolithic Cemetery at Tell Sabi Abyad, Syria, ca. 6200–6000. Poster Paper Presented at Interpreting the Late Neolithic in Northern Mesopotamia. Leiden: March, 26-29.

Sperling, J. 1976. Kumtepe in the Troad: Trial Excavations. *Hesperia* 45, 305-364.

Spigelman, M., Erdal, Y. S., Donoghue, H., Pinhasi, R. 2012. Golfer and Tennis Elbow in Byzantine Turkey: Epicondylitis A Neglected Occupation/Activity Marker in Antiquity. *Advances in Anthropology* 2, 24-30.

Takaoğlu, T. 2006. Late Neolithic in the Eastern Aegean: Excavations at Gülpınar in the Troad. *Hesperia* 75, 289-315.

Takaoğlu, T., Özdemir, A. 2018. The Middle Chalcolithic Period in the Troad: A new look from Gülpınar. S. Dietz, F. Mavridis, Z. Tankosic, T. Takaoğlu (Eds.), *Communities in Transition: The Circum-Aegean Later Neolithic Stage (ca. 5000/4800-3200/3000 BC)*. Oxford: Oxbow, 479-490.

Takaoğlu, T., Nanoglou, S. in press. Figurines and Figural Objects from Chalcolithic Gülpınar in NW Anatolia. *Anatolica* 47.

Tuncel, R., Şahoğlu, V. 2018. The Chalcolithic of Coastal Western Anatolia: A view from Liman Tepe, İzmir. S. Dietz, F. Mavridis, Z. Tankosic, T. Takaoğlu (Eds.), *Communities in Transition: The Circum-Aegean Later Neolithic Stage (ca. 5000/4800-3200/3000 BC),* Oxford: Oxbow, 513-529.

Turner, C. G., Machado, L. M. C. 1983. A New Dental Wear Pattern and Evidence for High Carbohydrate Consumption in a Brazilian Archaic Skeletal Population. *American Journal of Physical Anthropology* 61, 125-130.

von Wickede, A., Mısır, A. 1986. Çavi Tarlası 1984 Kazı Kampanyası. *VII. Kazı Sonuçları Toplantısı*, 103-111.

Werner, R. A., Franzblau, A., Gell, N., Hartigan, A., Ebersole, M., Armstrong, T. J. 2005. Predictors of Persistent Elbow Tendonitis Among Auto Assembly Workers. *Journal of Occupational Rehabilitation* 15, 393-400.

Yazıcı, D. 2009. Ege Gübre Kazısında Ortaya Çıkarılan Kalkolitik Dönem Çanak Çömlekleri. Ege University, Unpublished Master Thesis.



Figure 1. Map locating Gülpınar and other major sites with Chalcolithic finds on the coastal Troad and the adjacent island of Gökçeada (Imbros).

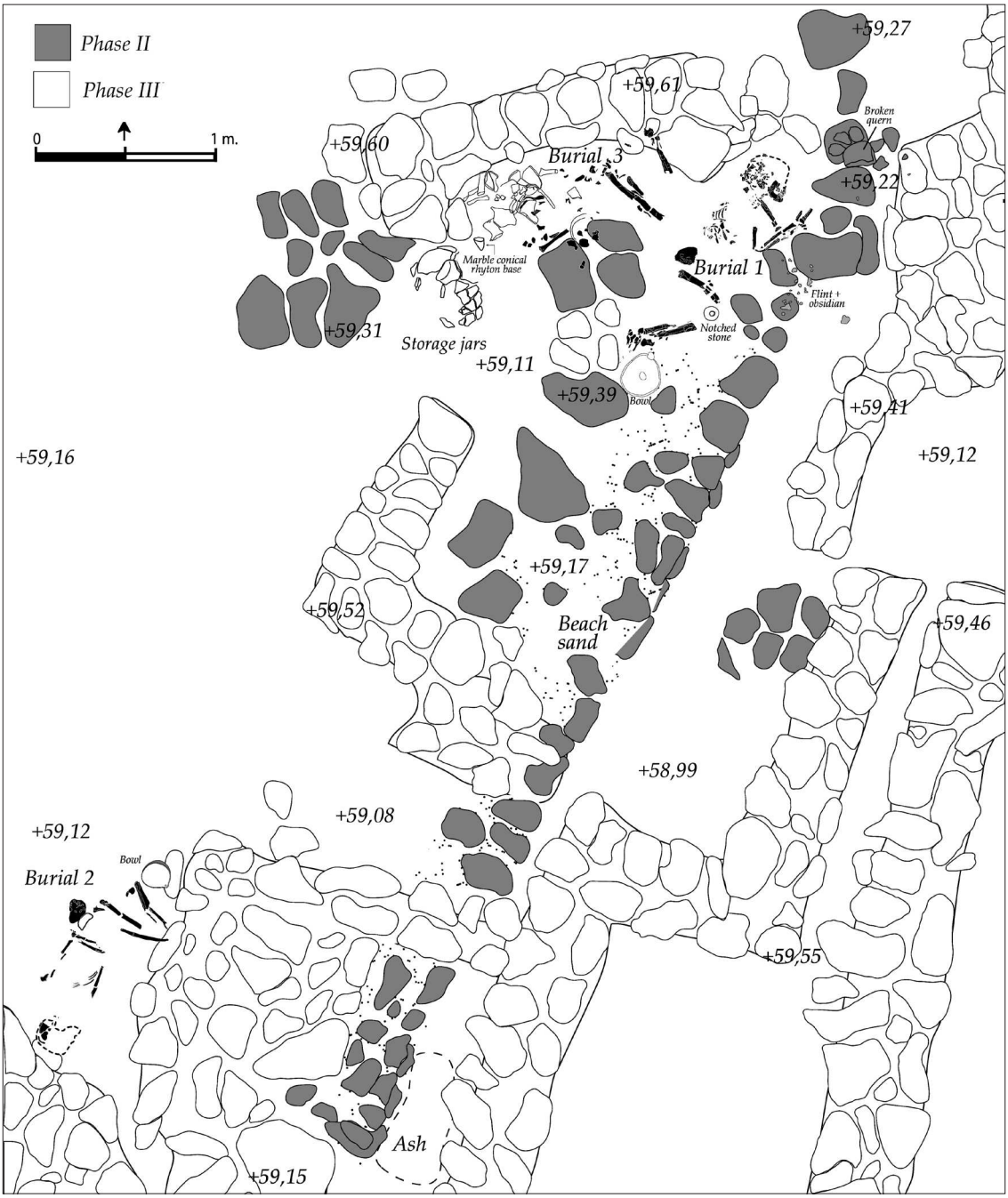


Figure 2. Plan of western part of Sector 3 locating burials 1-3.

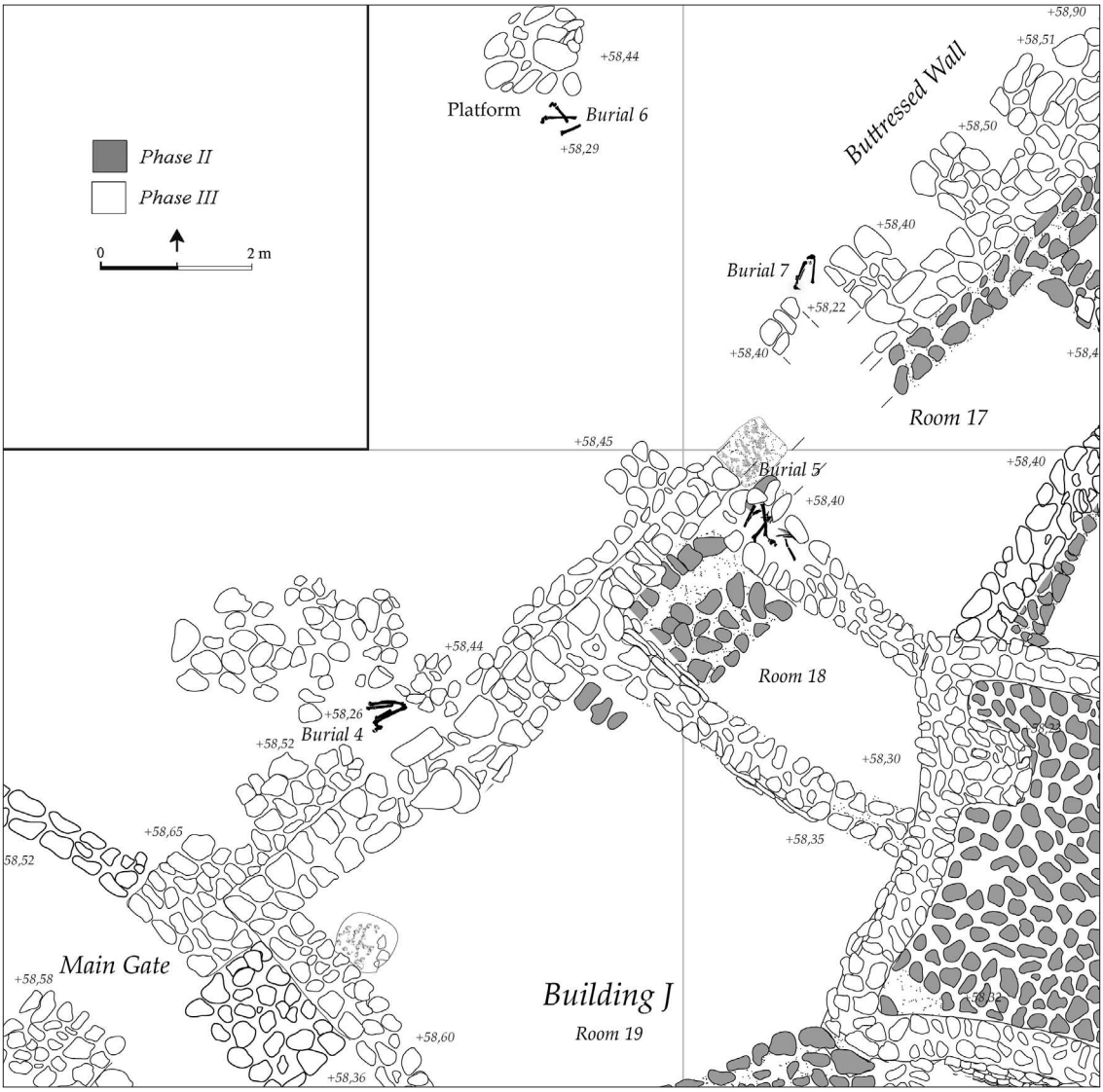


Figure 3. Plan of northwestern corner of Sector 3 showing the location of burials 4-7.



Figure 4. Burial 1 with a female body laid in a contracted position in Sector 3. Note the complete bowl placed in front of feet as offering.



Figure 5. Pottery vessels found near the feet (a-b) or on the chest (c-d) of the skeletons in burials 1-3 in Sector 3 at Gülpınar.
a) Burial 1, b) Burial 2, c-d) Burial 3.



Figure 6. Enamel hypoplasias on premolar and molar teeth of the skeleton in Burial 1.



Figure 7. Burial 2 with a female body laid in contracted position in Sector 3. Note complete bowl with tab handle placed in front of feet as offering.



Figure 8. Topmost layer of Burial 3 in Sector 3 during excavation after nearly complete pots were removed.

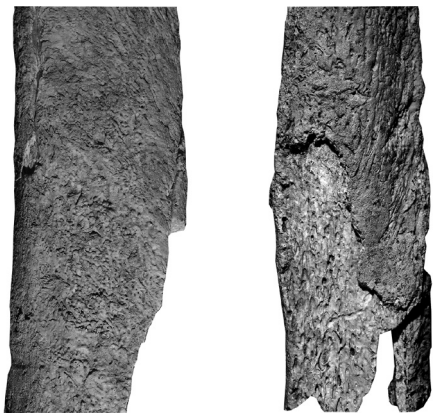


Figure 9. Infectious diseases on tibias of skeleton in Burial 4.



Figure 10. Epycondylitis of the lateral condyle of humerus on the skeleton in Burial 5.



Figure 11. Dental grooves obb the maxillary right canine of the skeleton in Burial 7.



Figure 12. Severe attrition, dental fracture, and periapical abscess of the skeleton in Burial 7.