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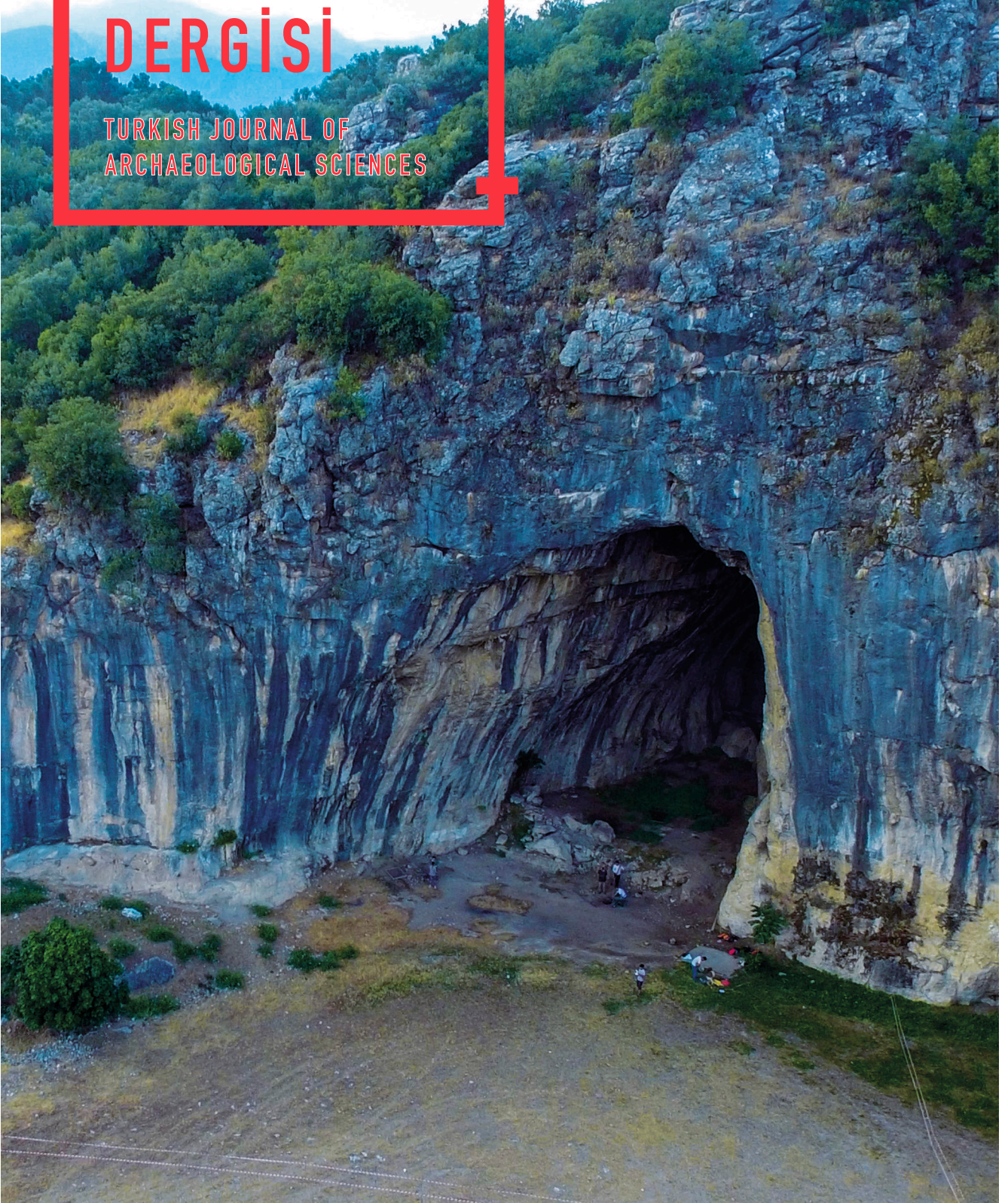
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## Editörlerden

Dördüncü yılımızda, dördüncü sayıyla herkese merhaba. Evrensel arkeolojinin diğer disiplinlerle iş birliği içinde, teknolojik yenilikleri ve araçları kullandığı günümüzde, daha fazla bilim diyerek “Arkeoloji Bilimleri” ismiyle çıkarmaya başladığımız dergimizin dördüncü sayısında bazı yeniliklere yer vermeyi gerekli bulduk. Bu sayıyla birlikte dergimizde artık kuramsal ve metodolojik yaklaşımlara, kitap tanıtım ve eleştirilerine yer vermeye başlıyoruz. Bu yeni adımın Türkiye’deki arkeoloji ortamının ihtiyacı olan çok seslilik, eleştiri ve tartışma ortamına katkı sağlayacağı düşüncesindeyiz. Özellikle de güncel devlet politikalarıyla Türkiye’deki arkeoloji ortamının yeşertmeye çalıştığı bilimsel çerçeve ve hedeflere olumsuz anlamda tesir edecek adımların atıldığı, arkeolojinin turizm ve restorasyonla karıştırıldığı koşullarda.

Güneş Duru & Mihriban Özbaşaran



## Note from the editors

Hello to everyone and welcome to our fourth year with this fourth issue. As archaeology universally depends on cooperative and technological innovation, we have thought to include some innovations in the fourth issue of our journal. With this new issue, we are now widening our spectrum to theoretical and methodological approaches as well as introducing and reviewing archaeological publications. We believe this will contribute to the multivocality, critique and discussion that archaeology in Türkiye needs to counterbalance current state policies that may have a negative impact on the scientific aims and framework that the discipline is trying to nurture. In a country where archaeology is often confused with tourism and restoration, we think it is critical to provide this forum.

Güneş Duru & Mihriban Özbaşaran



# Integrating Anthropological Science in Archaeological Practice: The Importance of Spatial Data

Brenna Hassett<sup>a</sup>, Haluk Sağlamtimur<sup>b</sup>

## Abstract

The excavation of human remains is a critical aspect of archaeology, and mortuary context forms a considerable portion of the archaeological record investigated by archaeologists. However, the scientific analysis of human remains is frequently limited to post-excavation, meaning that archaeological data is rarely integrated into the interpretation of human remains.

This paper examines the contribution of anthropological science during excavation using one specific class of data – spatial position – in order to understand how information on location affects the interpretation of human remains in archaeological contexts. Examining the utility of spatial information of human remains excavated from a mass grave at the site of Başur Höyük, near Siirt, Türkiye, we propose that spatial or location data collected at the level of the individual element is necessary to reconstruct the circumstances and actions in respect of the creation and formation of the studied mass grave.

**Keywords:** Geographic Information System (GIS), excavation, burial location

## Özet

Mezarlar arkeolojinin kritik konularından biridir ve ölüm sonrası sürecin bağlamı arkeologlar tarafından araştırılan arkeolojik kayıtların önemli bir bölümünü oluşturur. Ancak, insan kalıntılarının bilimsel analizi genellikle kazı sonrasıyla sınırlıdır. Bu da arkeolojik verilerin insan kalıntılarının yorumlanmasına nadiren entegre edildiği anlamına gelir. Bu makalede, kazı sırasında toplanan mekansal verinin insan kalıntılarının yorumlanmasını nasıl etkilediği tartışılmaktadır. Başur Höyük'te (Siirt, Türkiye) bulunan bir toplu mezarda birey düzeyinde toplanan

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mekansal verilerin ve konum özelliklerinin, mezarın oluşum koşulları ve eylemlerini yeniden yapılandırmak için ne denli önemli olduğunu öne sürüyoruz.

**Anahtar kelimeler:** Coęrafi Bilgi Sistemi (CBS), arkeolojik kazı, mezar yeri

## Introduction

Archaeology has had a long interest in the excavation of human remains; indeed, the origins of the discipline lie in the ‘barrow diggers’ of 18<sup>th</sup> century who investigated the tumuli and mounds associated with Neolithic and Bronze Age burial practices found across northern Europe. The passion for opening up the tombs of the past was driven, however, not by interest in the physical remains of the people buried; instead barrow digging, like the larger fetish for antiquities generally arising during the European ‘Enlightenment’, was motivated by the acquisition of objects (Clarke 1975). Acquiring antiquities allowed for a type of elite display that borrowed the gravitas of the past and extended it to the owner of an object. This was used to great effect by the colonial projects of 18<sup>th</sup> and 19<sup>th</sup> century Europe to further their claims to be inheritors of a tradition of ‘civilization’ and can be clearly seen in the collections of the major European museums today, not to mention in arenas of public display as in the case of the Luxor obelisk in the Place de Concorde in Paris (Elliott 2022). Interest in the routine excavation and analysis of human remains from the past would have to wait for the development of physical or, as it is now known, biological anthropology.

Anthropology as a discipline has its roots in the racialised theories of humanity that arose in the 18<sup>th</sup> and 19<sup>th</sup> centuries (Little and Sussman 2010; Blakey 2021). The practice of biological anthropology alongside archaeological excavation stems from an interest in the population (and racial) affinities of the past inhabitants of archaeological sites as revealed by the morphology and metrics of the skull, allowing for arguments about connection to those people and places to be made by modern-day excavators (Marks 2012). Categorisation of human remains into population groups remained the primary interest of biological anthropology through much of the 20<sup>th</sup> century (Larsen 2018), which placed a premium on the recovery of remains to measure in a laboratory rather than an overarching concern with their archaeological context. Bioarchaeology, the aspect of biological anthropology that takes an explicit interest in human remains as an archaeological object, only arose in the 1970s (Larsen 2018), alongside a greater interest in archaeological science as part of what has been often called the ‘New Archaeology’. For the last fifty years, however, there has been a growing emphasis on the fact that while the shape and metrics of human remains can reveal important information about the biological individual, there is an additional realm of information on that individual’s social and cultural being that is revealed by the circumstances of their deposition into the archaeological record (Parker Pearson 1999).

While there are clearly a number of different sources of information available from archaeological reconstruction of the deposition of human remains, including but not limited to chronology, associations with material culture, typologies and forms of funerary contexts (Parker Pearson 1999), this paper will look at one specific aspect of the archaeological record that has not always been treated as containing data relevant to the interpretation of human remains: spatial position. Spatial data is collected at the time of excavation and can be recorded at greater or lesser levels of detail depending on time and need. Most excavations will have a standardised method for collecting spatial position information; while these vary widely across archaeological traditions it is usual for archaeological data to be recorded in plan using either an absolute or locally-established spatial grid. Depending on the aims of the excavation, the spatial position of human remains might be recorded on any scale stretching from the individual skeletal element to not recorded at all, but since the advent of systemic excavation methods in the early 20<sup>th</sup> century (e.g. Petrie 1904) at least some location information for human remains is usually retained.

This research paper examines how integration of anthropological research questions into the archaeological practice of the excavation can benefit our interpretation of the past. Specifically, it examines the class of data that is most often collected during excavation but not included in later laboratory analysis of human remains: spatial data. The question this paper is interested in is which aspects of spatial data, or location, are important in interpreting human remains? This is a vital question as location data is recorded at the time of excavation, and often the biological anthropologist or specialist in studying human remains is not present during excavation. Using the case study of a highly complicated archaeological deposit of multiple human remains at the site of Başur Höyük, near Siirt, Türkiye, we can examine which elements of spatial data, or elements of location, were critical to interpreting the remains and make specific recommendations for integrating anthropological research aims within archaeological practice.

Location is a broad category of information, but for its utility in biological anthropology we can understand it as a statement of spatial position which operates at several different scales. At the largest scale, that of landscape, position carries critical information about the social and biological identity of the dead; it is a key indicator of the role that person held in life (Tainter 1978; Goldstein 1995). This might be conceived of as the difference between burial in a pyramid attended by considerable material culture and retainer burials, for instance, versus a deposition in an actively used midden; there are a series of intentional acts by the living community in placing the dead that convey that communities' interpretation of the social identity of the dead (Parker Pearson 1999). We might also think of the location of burial within a site as a critical factor in understanding variation in social status, differential treatment due to age, biological sex or gender, or even the roles carried out in life (Tainter 1978). This is perhaps best illustrated with the fairly well-known example of recent Christian burial practices, which

reflect considerable social information depending on the location of the burial within a specific mortuary setting (Craig and Buckberry 2010). High status individuals are preferentially buried near the heart of worship, inside the church; because of this preference earlier burials tend to be located closer to the church and later ones must be necessarily beyond them; and rules about the burial of the unbaptised or excommunicated mean that they must be excluded and are often found in separate non-sanctified areas (Craig and Buckberry 2010; Sayer 2011).

Moving to the scale of the individual, we can look to body positioning to understand cultural norms, which may vary widely from culture to culture or over geography and time (Ucko 1969; Parker Pearson 1999). Considerable variation is possible, from extended positions with an individual laid on their back to the well-known tightly flexed ‘hocker’ position, which mirrors the foetal position. Understanding these norms in a given culture is critical in order to understand when cultural traditions surrounding the treatment of the dead either change or are subverted. An example of the importance of burial position is found in the analysis of ‘deviant’ Anglo-Saxon burials; with individuals who had contravened social or legal norms in life buried prone rather than supine, or with skeletal elements removed or moved (Reynolds 2009).

Finally, we might also look at position at the scale of individual skeletal elements for information on post-mortem treatment. The articulation of skeletal elements, or their position within the deposit, provide considerable information as to the treatment of the remains after death. The lack of smaller skeletal elements, particularly from the extremities, might indicate the remains are found in a secondary position to their original interment or catchment; likewise elements out of articulation or in non-anatomic position (Knüsel and Robb 2016). The positioning of skeletal elements in relationship to one another has also been used to identify the presence of burial containers (Harris and Tayles 2012). Haddow and Knüsel provide an exemplary case for the utility of tight spatial control of excavated skeletal elements in their work establishing the retrieval of skulls from burial contexts at Çatalhöyük (Haddow and Knüsel 2017).

## **Case Study: Başur Höyük**

Excavation of the Early Bronze Age (3100-2800 BCE) cemetery at the site of Başur Höyük, near Siirt, Türkiye, took part as part of as much larger series of ‘rescue’ archaeological projects running from 2008-2015 under the direction of author Assoc. Prof. Haluk Sağlamtimur prior to the construction of the Ilisu Dam. Excavation at Başur Höyük uncovered nearly 7 millennia of human activity stretching from the Ubaid period to the medieval (Sağlamtimur, Batihan and Aydoğan 2020). The excavation team uncovered a stone-lined cist burial, the first of what would eventually be identified as an incredible series of burials dated to the Early Bronze Age 1 period (3100-2800 BCE) comprised of several different burial traditions (Hassett and Sağlamtimur 2020; Hassett 2023) including retainer burials that may be the earliest evidence of human

sacrifice (Hassett and Sağlamtimur 2018). In 2014, a further burial context was uncovered to the north of the sloped profile of the south-east quadrant of the mound which contained the cist graves of the EBA 1 cemetery. Measuring approx. 2.3 by 3 meters, this context was a roughly rectangular pit with its long axis aligned east to west (Sağlamtimur 2017). Initial investigation revealed multiple human remains in a very tightly packed space (Figure 1), but time constraints prevented excavation of more than a handful of skeletal elements during the field season. Instead, the decisions were made to backfill the context and invite a specialist team to excavate this context the next season.

In 2015, the author (BH) joined the Başur Höyük excavations as lead biological anthropologist. The research aims for the excavation of the mass burial, Grave 16, were to understand the circumstances of deposition of the human remains; something that could only be achieved by identifying the demography of the individuals buried, any palaeopathology within the remains, and the sequence of deposition. Limited time for the excavation meant that the excavation method had to be chosen and planned carefully in advance. The method should be as efficient as possible while still capturing sufficient data to reconstruct the circumstances of deposition. Available images of the exposed context (see Figure 1, again) were used to plan the work.

As clearly visible in the figure, the context included considerable numbers of skeletal elements, only some of which were in obvious articulation. It is in exactly this case that the spatial location of each skeletal element becomes critical. While the position of the remains in the mass burial in regards to the larger cemetery has been considered elsewhere (Hassett 2023), identifying the spatial position of all skeletal elements within the grave is necessary to elucidate the burial position of individual skeletons and potentially which elements belong to the same individuals.

## **Establishing Location**

As a basis for reconstructing location of anthropological data within the burial, standard processes were used to establish spatial locations of archaeological features including the development of a site grid and the use of a total station to establish three-dimensional points to locate features across the site. While this standard archaeological process of establishing spatial position is more than sufficient for locating archaeological contexts as they are recorded on site, no such process was in place for human remains. However, the sheer number of skeletal elements visible even in the initial 2014 exposure of the mass grave meant there would be insufficient time to record the spatial location of each individual element in the very limited time window during the 2015 excavation season. This required the development of a tiered spatial data collection strategy which accommodated both the desirability of recording spatial position for all skeletal elements and the limited time for excavation.



## Methods

The first approach of spatial data recording was to introduce a structure-from-motion (SfM) three-dimensional recording (James and Robson 2012) of the entire burial context with all human remains (Figure 2). Digital images were taken at regular intervals across the entire exposed surface of the context but with slight changes in angulation from about 45 degrees from the context surface to 135 degrees using a standard digital SLR camera (Nikon 500; Nikon). Spatial position was recorded by introducing photogrammetric targets – in this case, traditional plastic tea saucers, *çay tabakları* – to the burial contexts in several locations, and recording their spatial location with the total station. Post-excavation, these images were imported into a dedicated three-dimensional reconstruction software application (Morphosource Pro, Agisoft) following a method that has been previously described (Hassett and Lewis-Bale 2017). This software has been successfully used to build three-dimensional models with accurate spatial scaling (James and Robson 2012; Katz and Friess 2014) and the spatial location of the *çay tabakları* within the reconstruction was used to create a scaled three-dimensional digital reconstruction. This was repeated at regular intervals, creating what is essentially a digital elevation model of the grave before, during, and after excavation.

The second approach of spatial recording was carried out, when possible, at the level of the individual skeleton (Figure 3). Due to the intense commingling of skeletal remains, it was generally not possible to identify all skeletal elements belonging to a single individual. Therefore, where skeletal elements were found in articulation, they were treated as ‘an individual’; as a unit of recording. A sketch plan was made, all articulated elements were collected as a group, and the spatial position of all articulating points was recorded for in total 125 sets of articulated remains. In addition, 2-3 digital photographs of each ‘individual’ were taken with the camera lens facing directly downwards. Post excavation, these images were spatially rectified using visible features and the spatial location of articulations in the geographic information system QGIS (QGIS.org, 2015). They were then used to digitise the remains as visible both in the sketch plans and the digital images.

The third and final method of recording the location of the relevant bones applied was based on a physical string grid of 50 by 50-centimetre squares over the top of the entire context. The grid was labelled alphabetically east to west, and numerically north to south (Figure 3). It was introduced in order to balance the need to collect a very large amount ( $n = 4,744$ ) of unarticulated, isolated skeletal elements quickly and the desire to maintain some spatial positioning information for all human remains excavated. Post excavation, the spatial location of the grid square was attached to each isolated element in the statistical computing environment R (R Project Team, 2024).

## Results

### **Burial Position: Location at the Scale of the Individual**

From a biological anthropological standpoint, the location information is necessary to interpret the deposition of the remains and to understand the initial positioning of the human remains. In several other contexts within the EBA cemetery at Başur Höyük the normal body position had been established as semi-flexed, and positioned on the side with the head pointing towards east (Hassett and Sağlamtimur 2020; Sağlamtimur, Batıhan and Aydoğan 2020). The identification of body positions in the mass grave could provide an indication if the bodies within were treated in the same way as those in the other, larger cemetery. Information from both the 3D-recording and modelling as well as the digitised articulated remains were used to create a plan of all articulated body parts to establish the predominant body positions within the grave in QGIS (Figure 4). The plan shows that the recorded body positions vary so considerably that we can say with confidence that the remains in Grave 16 had been treated in a very different fashion than usual for the cemetery.

The bodies are not oriented in any particular way; some are prone, some are placed on their sides, and it is possible that some were also positioned face-down. There is evidence for fully extended ('spread-eagle') positioning; for semi-crouched positioning; and for tightly crouched positioning. Several individuals were identifiable from the walls of the grave as having been pressed very firmly against the edge of the grave with clear voids where soft tissue from underlying individuals would have been, suggesting that the fully-fleshed bodies were piled directly on top of one another. The contraction of burials in the north-east corner particularly is suggestive of having been aggressively compacted, possibly to accommodate the large stones of an underlying Uruk-period wall that emerge into the grave in that area. Overall, it seems to us that the remains were actually deposited extremely rapidly, with no specific intentional positioning. The 'splayed' position of some remains may even indicate that the body was tossed into the grave perhaps by two persons holding the limbs and swinging in order to land in the centre of the context.

### **Bone Position: Location at the Scale of the Individual Skeletal Element**

The spatial distribution of isolated skeletal elements was also examined to determine and double-check if there was any patterning to body position within the grave. Cranial, hand and foot elements were mapped to analyse if there was any patterning to their distribution in the grave that would suggest that taphonomic disturbance had resulted in the positioning observed during the excavation and by using the digital reconstructions of the articulated remains (Figure 5).

There was no pattern to the distribution of specific skeletal elements, suggesting that remains were in fact deposited with no regard for position within the grave as there were no specific areas where feet / skull / other elements were more common than elsewhere.

Some evidence of post-mortem treatment came from the relationship of articulated elements to each other, and the spatial distribution of isolated elements. The burials were interpreted as having been primary deposits due to the number of complete or near complete articulations of large and small elements (see Figure 4). The distribution of small and fragmentary isolated elements, including elements as small as ear ossicles, throughout the grave suggests that the movement of those elements out of articulation is a result of taphonomic processes and related movement within the burial context, most likely due to decomposition of bodies.

## Conclusion

Our study of the human remains, and their spatial relation suggests that the deposition of human corpses into a mass grave in the Early Bronze Age Cemetery at Başur Höyük represents a singular primary interment. This action happened relatively quickly with no care for the positioning of the bodies. This stands in contrast to the burials found until now at the site, and indeed to comparative contexts and sites of the period from Upper Mesopotamia such as Arslantepe (Frangipane 2006). It also contrasts considerably with the most well-known of 3<sup>rd</sup> millennium Mesopotamian mass graves, the Royal Cemetery at Ur, where body position of the deceased seems to have been almost the main focus of constructing the mortuary context (Woolley 1954). Ongoing archaeological work is slowly elucidating the social identities of the deceased and identifying aspects of difference from the individuals buried in the cist-grave EBA cemetery, with beads in particular adding further information that the mortuary activity at Başur Höyük may not all be carried out by the same social or cultural groups (Baysal and Sağlamtimur 2021)

The reconstruction of the location of individual skeletal elements and body position within the mass grave at Başur Höyük also allows us to identify those individuals as outliers within the larger cemetery. This could not be reconstructed without the careful integration of excavation planning into the plan for anthropological research and an emphasis on recording spatial data. While it was not possible to collect data at this level of granularity due to the constraints on excavation, best practice in future may be to ensure that any spatial data that could be lost through collection of human remains from archaeological contexts be recorded, not only at the level of the individual skeleton, but at the level of the individual skeletal element. It is possible that stronger spatial control of isolated elements – recording position in 3D space using a total station rather than assignment to a grid square) – would have offered access to further spatial information that could better distinguish clusters of remains that might have belonged to the same individual and allowed a fuller reconstruction of the deposition event that led to 63 individuals being placed in a mass grave.

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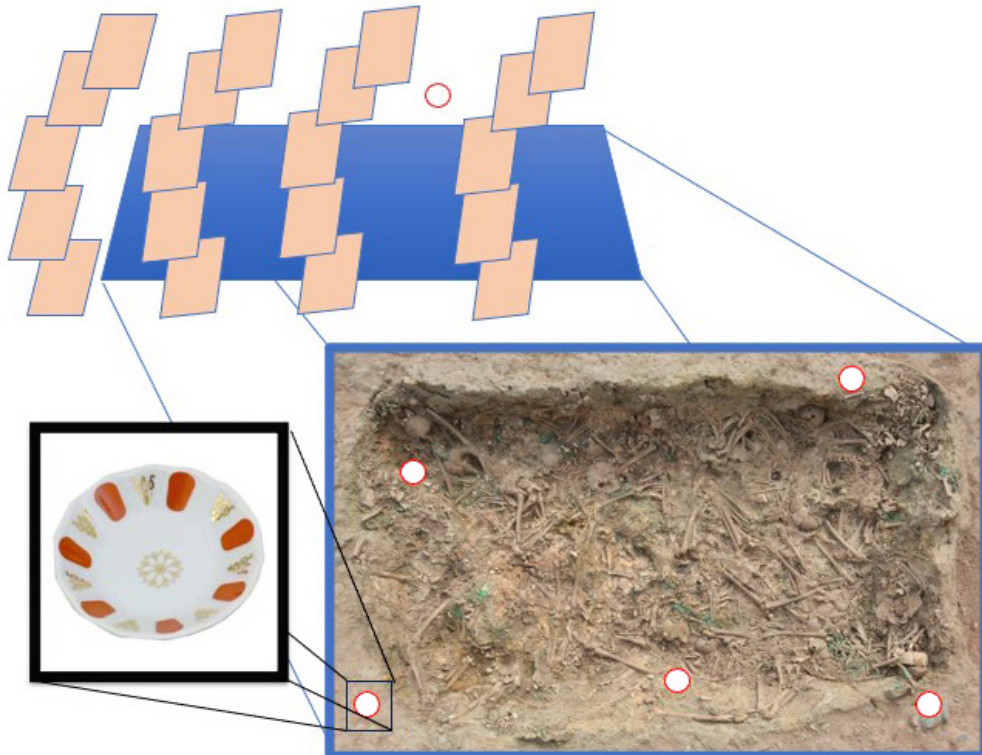
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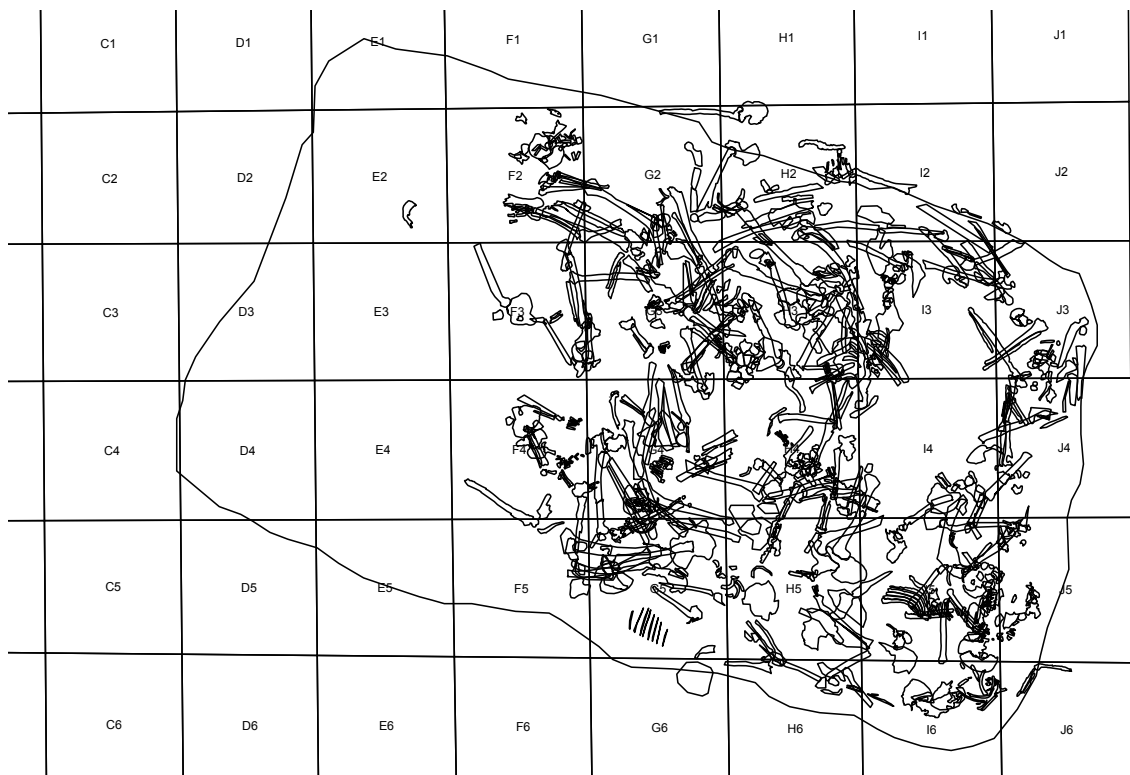
**Figure 1.** The exposure of the mass grave in 2014, before backfilling and full excavation in 2015 (Başur Höyük Research Project).



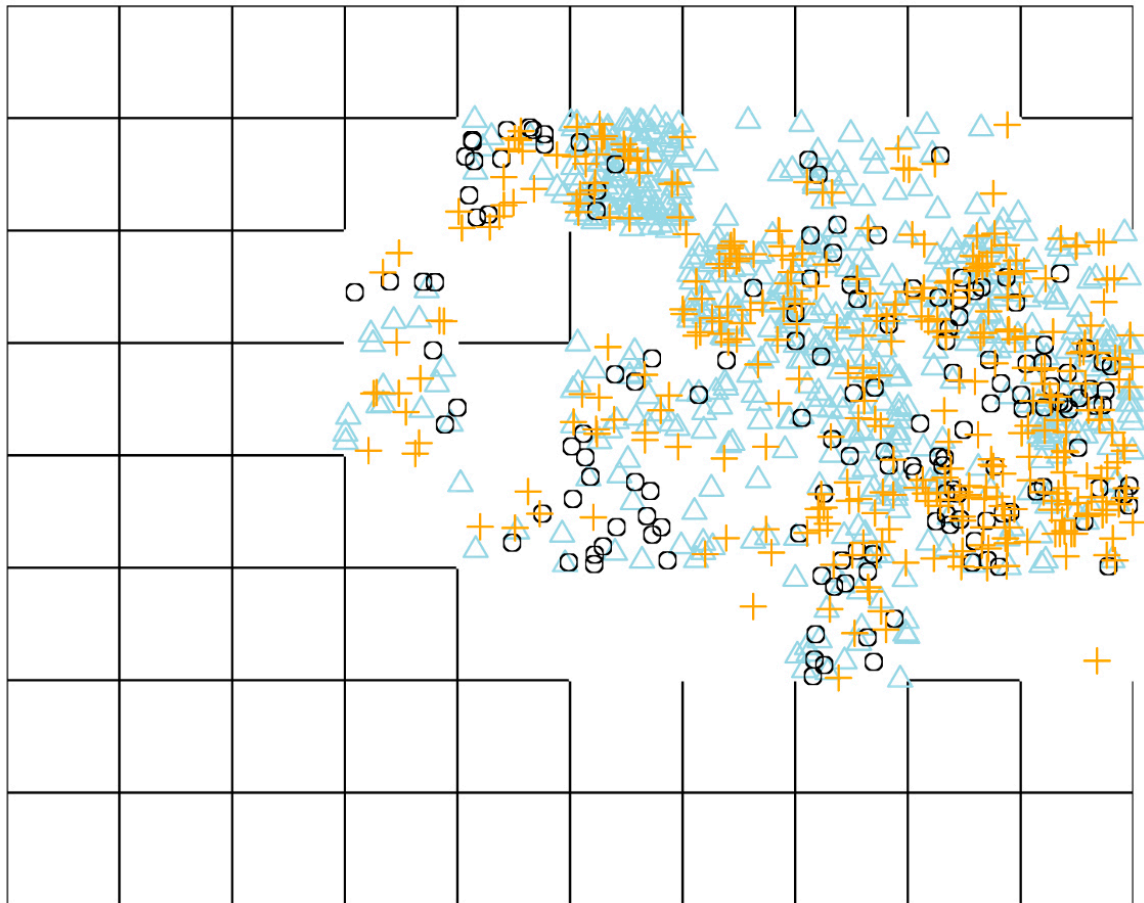
**Figure 2.** Three-dimensional capture of ongoing excavation exposure of Grave 16. At top, the overlapping rectangles indicated camera lens direction over the darker rectangle of the surface of Grave 16. At bottom, Grave 16 during preparation for 3D data capture showing location of photogrammetric targets (inset box) (Başur Höyük Research Project).



**Figure 3.** Example of spatial positioning data points collected from articulated remains. 'X' are indicative locations of major articulations. Note the skull, if present, is also included (Başur Höyük Research Project).



**Figure 4.** The digital reconstruction of all articulated skeletal elements. Each grid square is 50 x 50 cm, and north is to the top of the image.



**Figure 5.** Mapping of isolated skeletal elements according to anatomical location within Grave 16: blue, foot; orange, hand, and black, cranial. Note that the elements are assigned a random position within each grid square for the purpose of display. Grid squares are 50 x 50 cm, and north is at the top of the image.





## Amaç ve Kapsam

Arkeoloji bir süredir geçmişin yorumlanmasında teknoloji ve doğa bilimleri, mühendislik ve bilgisayar teknolojileri ile yoğun iş birliği içinde yeni bir anlayışa evrilmektedir. Üniversiteler, ilgili kurum ya da enstitülerde yeni açılmakta olan “Arkeoloji Bilimleri” bölümleri ve programları, geleneksel anlayışı terk ederek değişen yeni bilim iklimine adapte olmaya çalışmaktadır. Bilimsel analizlerden elde edilen sonuçların arkeolojik bağlam ile birlikte ele alınması, arkeolojik materyallerin, yerleşmelerin ve çevrenin yorumlanmasında yeni bakış açıları doğurmaktadır.

Türkiye’de de doğa bilimleri ile iş birliği içindeki çalışmaların olduğu kazı ve araştırma projelerinin sayısı her geçen gün artmakta, yeni uzmanlar yetişmektedir. Bu nedenle Arkeoloji Bilimleri Dergisi, Türkiye’de arkeolojinin bu yeni ivmenin bir parçası olmasına ve arkeoloji içindeki arkeobotanik, arkeozooloji, alet teknolojileri, tarihlendirme, mikromorfoloji, biyoarkeoloji, jeokimyasal ve spektroskopik analizler, Coğrafi Bilgi Sistemleri, iklim ve çevre modellemeleri gibi uzmanlık alanlarının çeşitlenerek yaygınlaşmasına katkı sağlamayı amaçlamaktadır. Derginin ana çizgisi arkeolojik yorumlamaya katkı sağlayan yeni anlayışlara, disiplinlerarası yaklaşımlara, yeni metod ve kuram önerilerine, analiz sonuçlarına öncelik vermek olarak planlanmıştır.

Arkeoloji Bilimleri Dergisi uluslararası hakemli bir dergidir. Dergi, Ege Yayınları tarafından çevrimiçi olarak yayınlanmaktadır. Kazı raporlarına, tasnif ve tanıma dayalı çalışmalara, buluntu katalogları ve özgün olmayan derleme yazılarına öncelik verilmeyecektir.



## Aims and Scope

Archaeology is being transformed by the integration of innovative methodologies and scientific analyses into archaeological research. With the establishment of new departments, institutes, and programs focusing on “Archaeological Sciences”, archaeology has moved beyond the traditional approaches of the discipline. When placed within their archaeological context, studies can provide novel insights and new interpretive perspectives to the study of archaeological materials, settlements and landscapes.

In Turkey, the number of interdisciplinary excavation and research projects incorporating scientific techniques is on the rise. A growing number of researchers are being trained in a broad range of scientific fields including but not limited to archaeobotany, archaeozoology, tool technologies, dating methods, micromorphology, bioarchaeology, geochemical and spectroscopic analysis, Geographical Information Systems, and climate and environmental modeling. The Turkish Journal of Archaeological Sciences aims to situate Turkish archaeology within this new paradigm and to diversify and disseminate scientific research in archaeology. New methods, analytical techniques and interdisciplinary initiatives that contribute to archaeological interpretations and theoretical perspectives fall within the scope of the journal. The Turkish Journal of Archaeological Sciences is an international peer-reviewed journal. The journal is published online by Ege Yayınları in Turkey. Excavation reports and manuscripts focusing on the description, classification, and cataloging of finds do not fall within the scope of the journal.





## Makale Gönderimi ve Yazım Kılavuzu

\* *Please see below for English*

### Makale Kabul Kriterleri

Makalelerin konu aldığı çalışmalar, Arkeoloji Bilimleri Dergisi'nin amaçları ve kapsamı ile uyumlu olmalıdır (bkz.: Amaç ve Kapsam).

Makaleler Türkçe veya İngilizce olarak yazılmalıdır. Makalelerin yayın diline çevirisi yazar(lar)ın sorumluluğundadır. Eğer yazar(lar) makale dilinde akıcı değilse, metin gönderilmeden önce anadili Türkçe ya da İngilizce olan kişilerce kontrol edilmelidir.

Her makaleye 200 kelimeyi aşmayacak uzunlukta Türkçe ve İngilizce yazılmış özet ve beş anahtar kelime eklenmelidir. Özete referans eklenmemelidir.

Yazarın Türkçesi veya İngilizcesi akıcı değilse, özet ve anahtar kelimelerin Türkçe veya İngilizce çevirisi editör kurulu tarafından üstlenilebilir.

Metin, figürler ve diğer dosyalar wetransfer veya e-posta yoluyla **archaeologicalsciences@gmail.com** adresine gönderilmelidir.

### Makale Kontrol Listesi

*Lütfen makalenizin aşağıdaki bilgileri içerdiğinden emin olun:*

- Yazarlar (yazarların adı-soyadı ve iletişim bilgileri buradaki sırayla makale başlığının hemen altında paylaşılmalıdır)
- Çalışılan kurum (varsa)
- E.mail adresi
- ORCID ID

*Makalenin içermesi gerekenler:*

- Başlık
- Özet (Türkçe ve İngilizce)
- Anahtar kelimeler
- Metin
- Kaynakça
- Figürler
- Tablolar

### Bilimsel Standartlar ve Etik

- Gönderilen yazılar başka bir yerde yayınlanmamış veya yayınlanmak üzere farklı bir yere gönderilmemiş olmalıdır.
- Makaleler özgün ve bilimsel standartlara uygun olmalıdır.

- Makalelerde cinsiyetçi, ırkçı veya kültürel ayırım yapmayan, kapsayıcı bir dil kullanılmalıdır (“insanoğlu” yerine “insan”; “bilim adamı” yerine “bilim insanı” gibi).

## Yazım Kuralları

### Metin ve Başlıkların Yazımı

- Times New Roman karakterinde yazılan metin 12 punto büyüklüğünde, iki yana yaslı ve tek satır aralıklı yazılmalıdır. Makale word formatında gönderilmelidir.
- Yabancı ve eski dillerdeki kelimeler *italik* olmalıdır.
- Başlık ve alt başlıklar **bold** yazılmalıdır.
- Başlıklar numaralandırılmamalı, italik yapılmamalı, altları çizilmemelidir.
- Başlık ve alt başlıklarda yalnızca her kelimenin ilk harfi büyük olmalıdır.

### Referans Yazımı

*Ayrıca bkz.: Metin İçi Atıflar ve Kaynakça Yazımı*

- Referanslar metin içinde (Yazar yıl, sayfa numarası) şeklinde verilmelidir.
- Referanslar için dipnot ve son not kullanımından kaçınılmalıdır. Bir konuda not düşme amacıyla gerektiği takdirde dipnot tercih edilmelidir.
- Dipnotlar Times New Roman karakterinde, 10 punto büyüklüğünde, iki yana yaslı, tek satır aralıklı yazılmalı ve her sayfa sonuna süreklilik izleyecek şekilde eklenmelidir.

### Şekiller ve Tablolar

- Makalenin altına şekiller ve tablolar için bir başlık listesi eklenmelidir. Görsellerde gerektiği takdirde kaynak belirtilmelidir. Her şekil ve tabloya metin içerisinde gönderme yapılmalıdır (Şekil 1 veya Tablo 1).
- Görseller Word dokümanının içerisine yerleştirilmemeli, jpg veya tiff formatında, ayrı olarak gönderilmelidir.
- Görüntü çözünürlüğü basılması istenen boyutta ve 300 dpi'nin üzerinde olmalıdır.
- Görseller Photoshop ve benzeri programlar ile müdahale edilmeden olabildiğince ham haliyle gönderilmelidir.
- Excel'de hazırlanmış tablolar ve grafikler var ise mutlaka bunların PDF ve Excel dokümanları gönderilmelidir.

### Tarihlerin ve Sayıların Yazımı

- MÖ ve MS kısaltmalarını harflerin arasına nokta koymadan kullanınız (örn.: M.Ö. yerine MÖ).
- “Bin yıl” ya da “bin yıl” yerine “... binyıl” kullanınız (örn.: MÖ 9. binyıl).
- “Yüzyıl”, “yüz yıl” ya da “yy” yerine “yüzyıl” kullanınız (örn.: MÖ 7. yüzyıl).
- Beş veya daha fazla basamaklı tarihler için sondan sayarak üçlü gruplara ayırmak suretiyle sayı gruplarının arasına nokta koyunuz (örn.: MÖ 10.500)
- Dört veya daha az basamaklı tarihlerde nokta kullanmayınız (örn.: MÖ 8700).
- 0-10 arasındaki sayıları rakamla değil yazıyla yazınız (örn.: “8 kez yenilenmiş taban” yerine “sekiz kez yenilenmiş taban”).

## Noktalama ve İşaret Kullanımı

- Ara cümleleri lütfen iki çizgi ile ayırınız (—). Çizgi öncesi ve sonrasında boşluk bırakmayınız.
- Sayfa numaraları, tarih ve yer aralıklarını lütfen tek çizgi (-) ile ayırınız: 1989-2006; İstanbul-Kütahya.

## Kısaltmaların Yazımı

- Sık kullanılan bazı kısaltmalar için bkz.:

Yaklaşık:	yak.	Circa:	ca.
Bakınız:	bkz.	Kalibre:	kal.
Örneğin:	örn.	ve diğerleri:	vd.

## Özel Fontlar

- Makalede özel bir font kullanıldıysa (Yunanca, Arapça, hiyeroglif vb.) bu font ve orijinal metnin PDF versiyonu da gönderilen dosyalar içerisine eklenmelidir.

## Metin İçi Atıflar ve Kaynakça Yazımı

- Her makale, metin içerisinde atıf yapılmış çalışmalardan oluşan ve “Kaynakça” olarak başlıklandırılan bir referans listesi içermelidir. Lütfen metin içerisinde bulunan her referansın kaynakçaya da eklendiğinden emin olun.
- Metin içerisindeki alıntılar doğrudan yapılabilir: ‘...Esin (1995)’in belirtmiş olduğu gibi’ ya da parantez içerisinde verilebilir: ‘analiz sonuçları gösteriyor ki ... (Esin 1995).’
- Aynı parantez içerisindeki referanslar yayın yılına göre sıralanmalı ve “;” ile ayrılmalıdır: ‘... (Dinçol ve Kantman 1969; Esin 1995; Özbal vd. 2004).’
- Aynı yazarın farklı yıllara ait eserlerine yapılan atıflarda yazarın soyadı bir kere kullanılmalı ve eser yılları “,” ile ayrılmalıdır: ‘... (Peterson 2002, 2010).’
- Aynı yazar(lar)ın aynı yıl içerisindeki birden fazla yayınına referans verileceği durumlarda yayın yılının yanına harfler ‘a’, ‘b’, ‘c’ gibi alfabetik olarak koyulmalıdır.
- Tek yazarlı kaynakları, aynı yazar adıyla başlayan çok yazarlı kaynaklardan önce yazınız.
- Aynı yazar adıyla başlayan fakat farklı eş yazarlara sahip kaynakları ikinci yazarın soyadına göre alfabetik sıralayınız.
- Aynı yazara ait birden fazla tek yazarlı kaynak olması durumunda kaynakları yıllara göre sıralayınız.
- Dergi makaleleri için doi bilgisi varsa kaynakçada mutlaka belirtiniz.

*Aşağıda, farklı kaynakların metin içerisinde ve kaynakçada nasıl yazılacağına dair örnekler bulabilirsiniz.*

## Tek yazarlı dergi makaleleri, kitap içi bölümler ve kitaplar

*Metin içerisinde:*

Yazarın soyadı ve yayın yılı (Esin 1995).

*Sayfa sayısı bilgisi verilecekse:*

Yazarın soyadı ve yayın yılı, sayfa sayısı (Esin 1995, 140).

*Dergi makalesi:*

Bickle, P. 2020. Thinking Gender Differently: New Approaches to Identity Difference in the Central European Neolithic. *Cambridge Archaeological Journal* 30(2), 201-218. <https://doi.org/10.1017/S0959774319000453>

*Kitap içi bölüm:*

Esin, U. 1995. Aşıklı Höyük ve Radyo-Aktif Karbon Ölçümleri. A. Erkanal, H. Erkanal, H. Hüryılmaz, A. T. Ökse (Eds.), *İ. Metin Akyurt - Bahattin Devam Anı Kitabı. Eski Yakın Doğu Kültürleri Üzerine İncelemeler*, İstanbul: Arkeoloji ve Sanat Yayınları, 135-146.

*Kitap:*

Peterson, J. 2002. *Sexual Revolutions: Gender and Labor at the Dawn of Agriculture*. Walnut Creek, CA: AltaMira Press.

## **İki yazarlı dergi makaleleri, kitap içi bölümler ve kitaplar**

*Metin içerisinde:*

Her iki yazarın soyadı ve yayın yılı (Dinçol ve Kantman 1969, 56).

*Dergi makalesi:*

Pearson, J., Meskell, L. 2015. Isotopes and Images: Fleshing out Bodies at Çatalhöyük. *Journal of Archaeological Method and Theory* 22, 461-482. <https://doi.org/10.1007/s10816-013-9184-5>

*Kitap içi bölüm:*

Özkaya, V., San, O. 2007. Körtik Tepe: Bulgular Işığında Kültürel Doku Üzerine İlk Gözlemler. M. Özdoğan, N. Başgelen (Eds.), *Türkiye'de Neolitik Dönem. Yeni Kazılar, Yeni Bulgular*, İstanbul: Arkeoloji ve Sanat Yayınları, 21-36.

*Kitap:*

Dinçol, A. M., Kantman, S. 1969. *Analitik Arkeoloji, Denemeler*. Anadolu Araştırmaları III, Özel sayı, İstanbul: Edebiyat Fakültesi Basımevi.

## **Üç ve daha çok yazarlı dergi makaleleri ve kitap içi bölümler**

*Metin içerisinde:*

İlk yazarın soyadı, "vd." ve yayın yılı (Özbal vd. 2004).

*Dergi makalesi:*

Özbal, R., Gerritsen, F., Diebold, B., Healey, E., Aydın, N., Loyet, M., Nardulli, F., Reese, D., Ekstrom, H., Sholts, S., Mekel-Bobrov, N., Lahn, B. 2004. Tell Kurdu Excavations 2001. *Anatolica* 30, 37-107.

*Kitap içi bölüm:*

Pearson, J., Meskell, L., Nakamura, C., Larsen, C. S. 2015. Reconciling the Body: Signifying Flesh, Maturity, and Age at Çatalhöyük. I. Hodder, A. Marciniak (Eds.), *Assembling Çatalhöyük*, Leeds: Maney Publishing, 75-86.

## Editörlü kitaplar

*Metin içerisinde:*

Yazar(lar)ın soyadı ve yayın yılı (Akkermans ve Schwartz 2003).

Akkermans, P. M. M. G., Schwartz, G. M. 2003. (Eds.) *The Archaeology of Syria. From Complex Hunter-Gatherers to Early Urban Societies (c. 16.000-300 BC)*. Cambridge: Cambridge University Press.

*Web kaynağı:*

Soyad, Ad. Web Sayfasının Başlığı. Web Sitesinin Adı. Yayınlayan kurum (varsa), yayın tarihi. Erişim tarihi. URL.





## Submission and Style Guideline

### Submission Criteria for Articles

The content of the manuscripts should meet the aims and scope of the Turkish Journal of Archaeological Sciences (cf. Aims and Scope).

Manuscripts may be written in Turkish or English. The translation of articles into English is the responsibility of the author(s). If the author(s) are not fluent in the language in which the article is written, they must ensure that the text is reviewed, ideally by a native speaker, prior to submission.

Each manuscript should include a Turkish and an English abstract of up to 200 words and five keywords in both Turkish and English. Citations should not be included in the abstract.

If the author(s) are not fluent in the language of the manuscript, a translation of the abstract and the keywords may be provided by the editorial board.

Manuscripts, figures, and other files should be sent via wetransfer or e-mail to [archaeologicalsciences@gmail.com](mailto:archaeologicalsciences@gmail.com)

### Submission Checklist

*Each article must contain the following:*

- Authors (please provide the name-last name and contact details of each author under the main title of the manuscript)
- Affiliation (where applicable)
- E-mail address
- ORCID ID

*The manuscript should contain:*

- Title
- Abstract (in English and Turkish)
- Keywords
- Text
- References
- Figures (when applicable)
- Tables (when applicable)

### Scientific Standards and Ethics

- Submitted manuscripts should include original research that has not been previously published or submitted for publication elsewhere.
- The manuscripts should meet scientific standards.
- Manuscripts should use inclusive language that is free from bias based on sex, race or ethnicity, etc. (e.g., “he or she” or “his/her/their” instead of “he” or “his”) and avoid terms that imply stereotypes (e.g., “humankind” instead of “mankind”).

## Style Guide

### Manuscript Formatting

- Manuscripts should be written in Times New Roman 12-point font, justified and single-spaced. Please submit the manuscript as a word document.
- Words in foreign and ancient languages should be *italicized*.
- Titles and subtitles should appear in **bold**.
- Titles and subtitles should not be numbered, italicized, or underlined.
- Only the first letter of each word in titles and subtitles should be capitalized.

### References

*Cf.: In-Text Citations and References*

- In-text citations should appear inside parenthesis (Author year, page number).
- Footnotes and endnotes should not be used for references. Comments should be included in footnotes rather than endnotes.
- The footnotes should be written in Times New Roman 10-point font, justified and single-spaced, and should be continuous at the bottom of each page.

### Figures and Tables

- Please provide a caption list for figures and tables following the references. Provide credits where applicable. Each figure and table should be referenced in the text (Figure 1, or Table 1), but please do not include figures in the text document.
- Each figure should be submitted separately as a jpg or tiff file.
- Images should be submitted in the dimensions in which they should appear in the published text and their resolution must be over 300 dpi.
- Please avoid editing the figures in Photoshop or similar programs but send the raw version of the figures if possible.
- Tables and graphs prepared in Excel should be sent as both PDF and Excel documents.

### Dates and Numbers

- Please use BCE/CE and please avoid using dots without dots (i.e., BCE instead of BC or B.C.).
- Please use a dot for numbers and dates with 5 or more digits (i.e., 10.500 BCE).
- Please avoid using dots for numbers and dates with 4 or less digits (i.e., 8700 BCE).
- Please spell out whole numbers from 0 to 10 (e.g., “the floor was renewed eight times” instead of “the floor was renewed 8 times”).

### Punctuation

- Please prefer em dashes (—) for parenthetical sentences: “Children were buried with various items, the adolescents—individuals between the ages of 12-19—had the most variety in terms of grave goods.”
- Please prefer an en dash (-) between page numbers, years, and places: 1989-2006; İstanbul-Kütahya.

## Abbreviations

- Commonly used abbreviations:

Approximately:	approx.	Figure:	Fig.
Confer:	cf.	<i>Id est:</i>	i.e.,
Circa:	ca.	<i>Exempli gratia:</i>	e.g.,
Calibrated:	cal.		

## Special Fonts

- If a special font must be used in the text (e.g., Greek or Arabic alphabet or hieroglyphs), the text in the special font and the original manuscript should be sent in separate PDF files.

## In-Text Citations and References

- Each article should contain a list of references in a section titled “References” at the end of the text. Please ensure that all papers cited in the text are listed in the bibliography.
- Citations in the text may be made directly, e.g., ‘as shown by Esin (1995) ...’ or in parenthesis, e.g., ‘research suggests ... (Esin 1995)’.
- References within the same parenthesis should be arranged chronologically and separated with a “;”, e.g., ‘... (Dinçol and Kantman 1969; Esin 1995; Özbal et al. 2004).’
- In references to the studies by the same author from different years, please use the last name of the author once, followed by the years of the cited studies, each separated by a “;”, e.g., ‘... (Peterson 2002, 2010).
- More than one reference from the same author(s) in the same year must be identified by the letters ‘a’, ‘b’, ‘c’ placed after the year of publication.
- When dealing with multiple papers from the same author, single authored ones should be written before the studies with multiple authors.
- When dealing with papers where the first author is the same, followed by different second (or third, and so on) authors, the papers should be listed alphabetically based on the last name of the second author.
- When dealing with multiple single-authored papers of the same author, the papers should be listed chronologically.
- Please provide the doi numbers of journal articles.

*Below, you may find examples for in-text citations and references.*

### Single-authored journal articles, book chapters, and books

*In-text:*

Last name and publication year (Esin 1995).

*If the page number is indicated:*

Last name and publication year, page number (Esin 1995, 140).

*Journal article:*

Bickle, P. 2020. Thinking Gender Differently: New Approaches to Identity Difference in the Central European Neolithic. *Cambridge Archaeological Journal* 30(2), 201-218. <https://doi.org/10.1017/S0959774319000453>

*Book chapter:*

Esin, U. 1995. Aşıklı Höyük ve Radyo-Aktif Karbon Ölçümleri. A. Erkanal, H. Erkanal, H. Hüryılmaz, A. T. Ökse (Eds.), *İ. Metin Akyurt - Bahattin Devam Anı Kitabı. Eski Yakın Doğu Kültürleri Üzerine İncelemeler*, İstanbul: Arkeoloji ve Sanat Yayınları, 135-146.

*Book:*

Peterson, J. 2002. *Sexual Revolutions: Gender and Labor at the Dawn of Agriculture*. Walnut Creek, CA: AltaMira Press.

### **Journal articles, book chapters, and books with two authors**

*In-text:*

Last names of both authors and publication year (Dinçol and Kantman 1969, 56).

*Journal article:*

Pearson, J., Meskell, L. 2015. Isotopes and Images: Fleshing out Bodies at Çatalhöyük. *Journal of Archaeological Method and Theory* 22, 461-482. <https://doi.org/10.1007/s10816-013-9184-5>

*Book chapter:*

Özkaya, V., San, O. 2007. Körtik Tepe: Bulgular Işığında Kültürel Doku Üzerine İlk Gözlemler. M. Özdoğan, N. Başgelen (Ed.), *Türkiye'de Neolitik Dönem. Yeni Kazılar, Yeni Bulgular*, İstanbul: Arkeoloji ve Sanat Yayınları, 21-36.

*Book:*

Dinçol, A. M., Kantman, S. 1969. *Analitik Arkeoloji, Denemeler*. Anadolu Araştırmaları III, Özel sayı, İstanbul: Edebiyat Fakültesi Basımevi.

### **Journal articles and book chapters with three or more authors**

*In-text:*

Last name of the first author followed by “et al.” and the publication year (Özbal et al. 2004).

*Journal article:*

Özbal, R., Gerritsen, F., Diebold, B., Healey, E., Aydın, N., Loyet, M., Nardulli, F., Reese, D., Ekstrom, H., Sholts, S., Mekel-Bobrov, N., Lahn, B. 2004. Tell Kurdu Excavations 2001. *Anatolica* 30, 37-107.

*Book chapter:*

Pearson, J., Meskell, L., Nakamura, C., Larsen, C. S. 2015. Reconciling the Body: Signifying Flesh, Maturity, and Age at Çatalhöyük. I. Hodder, A. Marciniak (Eds.), *Assembling Çatalhöyük*, Leeds: Maney Publishing, 75-86.

## Edited books

### *In-text:*

Last name(s) of the author(s) and publication year (Akkermans and Schwartz 2003).

Akkermans, P. M. M. G., Schwartz, G. M. 2003. (Eds.) *The Archaeology of Syria. From Complex Hunter-Gatherers to Early Urban Societies (c. 16.000-300 BC)*. Cambridge: Cambridge University Press.

### *Web source:*

Last name, Initial of the first name. Title of the web page. Title of the website. Institution (where applicable), publication date. Access date. URL.