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A Bridge from Byzantium to Modern Day Istanbul: An Overview of Animal Skeleton Remains Found During Metro and Marmaray Excavations

Vedat ONAR[1], Hasan ALPAK[1], Gülsün PAZVANT[1], Altan ARMUTAK[2], Nazan GEZER İNCE[1], Zeynep KIZILTAN[3]*

[1]*Istanbul University Veterinary Faculty, Department of Anatomy, 34320 Avcilar, Istanbul, Turkey*
[2]*Istanbul University Veterinary Faculty, Department of Veterinary History and Deontology, 34320 Avcilar, Istanbul, Turkey*
[3]*Istanbul Archaeological Museums, Osman Hamdi Bey Str., Gülhane, Istanbul, Turkey*

**Corresponding Author: Vedat ONAR İstanbul Üniversitesi Veteriner Fakültesi Anatomi Anabilim Dalı Osteoarkeoloji Laboratuvarı, 34320, Avcılar, İstanbul*
e-mail: onar@istanbul.edu.tr

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ABSTRACT

In the course of the construction work and subsequent excavation in the historic part of Istanbul at Yenikapı in connection with the Marmaray Rail project linking the city's European and Asian parts with a tunnel under the Bosporus, numerous animal skeletons have been unearthed. This study is an overview of the preliminary examination results. Since project initiation in 2004 a great number of archaeological finds have been made, including animal remains scattered over the entire excavation area. Radiocarbon dating (^{14}C) of the 54 animal species identified puts their age range from Early Byzantium (4^{th}-7^{th} century AD) to Late Byzantium (15^{th} century AD). The most abundant skeletons were those of horses (*Equus caballus* L.).

Key Words: Animal skeletons, Metro and Marmaray excavations, Byzantium, Istanbul

ÖZET

BİZANS İLE MODERN İSTANBUL ARASINDA KÖPRÜ: YENİKAPI METRO VE MARMARAY KAZILARI HAYVAN İSKELET KALINTILARINA GENEL BİR BAKIŞ

Bu çalışmada Yenikapı Metro ve Marmaray kazılarında ortaya çıkarılan hayvan iskelet kalıntılarının ön inceleme sonuçları değerlendirilmiştir. 2004 yılında başlıyan kazı çalışmalarında, çok sayıda arkeolojik materyal yanında alanın tümüne yayılmış hayvan iskeletleri elde edilmiştir. Radyokarbon (^{14}C) tarihlendirmesi sonucu Erken Bizans'tan (4.-7. yy) Geç Bizans'a (15. yy) kadar değişen zaman dilimine ait olan bu hayvan iskelet kalıntıları içerisinde başta atlar (*Equus caballus* L.) olmak üzere yaklaşık 54 türe ait kalıntılar tespit edilmiştir.

Anahtar Kelimeler: Hayvan iskeletleri, Metro ve Marmaray kazıları, Bizans, İstanbul

Introduction

Yenikapı is the most important transfer station on the European side of Istanbul connecting the subway system (Metro) with the Marmaray project which links both sides of the city with a rail tunnel under the Bosporus. During the construction work at Yenikapı a large number of antique shipwrecks and animal skeletons were discovered. In the light of these important finds, organised excavations began as early as 2004 (Figure 1) with the permission of the Ministry of Culture, General Directorate of Cultural Heritage and Museums, and under the guidance of the Archaeological Museum. The excavation area of 58000 m^2 covers two different project areas - Metro and Marmaray - without, however, being subject to any project-related limitations. While the work in the Marmaray area has been completed in 2010, work in the Metro area is still in progress.

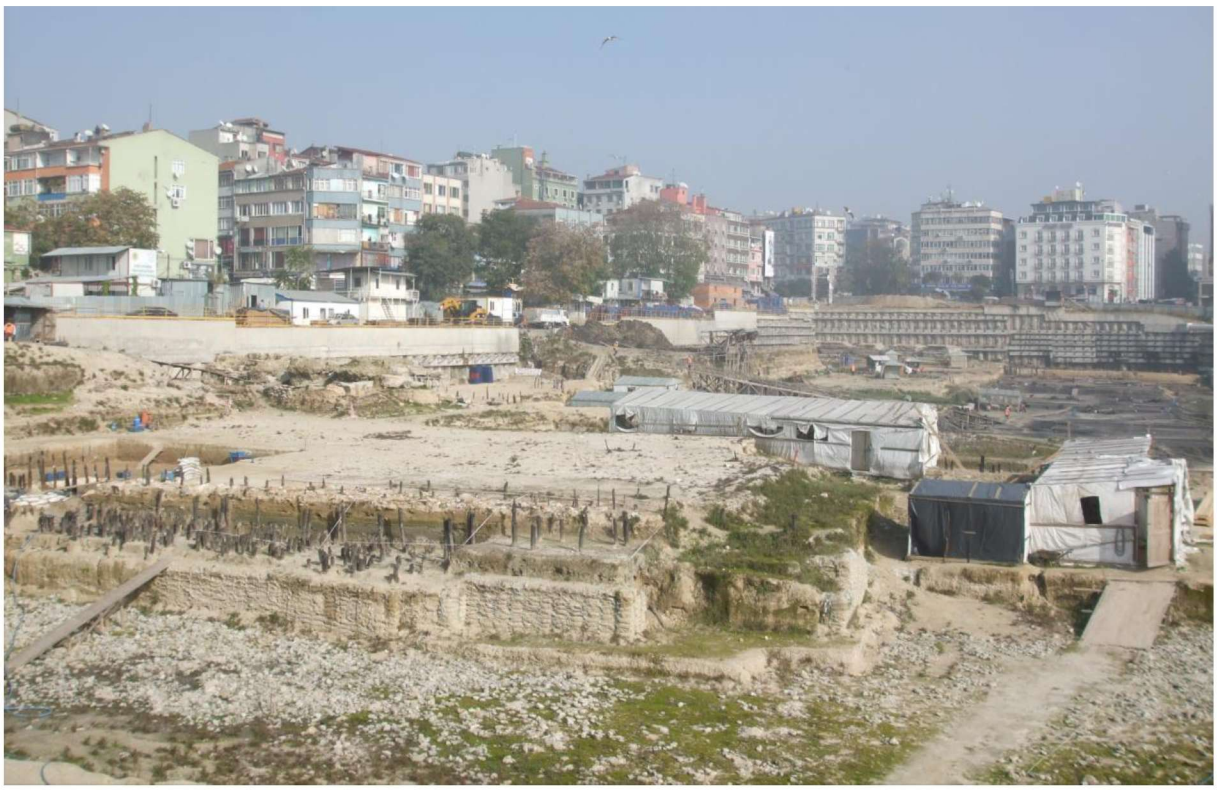

Figure 1. View of Yenikapı excavation area.

Şekil 1. Yenikapı kazı alanının görüntüsü.

In Byzantine times, the Theodosius harbour was the most important port on the shores of the Marmara Sea. Both written sources and old maps give an idea of its approximate position, they were, however, not precise enough to pinpoint its exact location (Başaran, 2008). Emperor I. Theodosius (379-395 AD) is credited with having constructed a harbour in a cove extending deep inland which over the centuries has been silted up (Müller-Wiener, 1998) (Figure 2). The initial site was later extended and equipped with a breakwater to the south satisfying the needs and conditions in those days (Kocabaş and Kocabaş, 2008). This harbour located in a natural cove at the mouth of the Lykos (Bayrampaşa) brook, was known as Portus Theodosiacus. Towards the middle of the 7th century, with the end of grain shipments from Egypt, the port lost its most important function. Despite this, it continued to be used

(Kocabaş and Kocabaş, 2008) but slowly filled up with the silt carried by the Lykos brook, and by the 12th century the harbour area had become part of the land area of Byzantium (Başaran, 2008; Müller-Wiener, 1998).

Small and large domestic livestock played an important role in the animal-based diet in old times as it still plays today. Animals were reared both for consumption and labour with a wide range of applications. They provided wool and leather for clothing, milk, eggs and meat to the diet, and their muscle power in tilling the earth and moving or transporting people and heavy loads.

Animal bones among archaeological remains have always attracted the attention of zoo archaeologists because they not only provide insights in the eating habits in former times but also information about the morphology of the animals themselves like shoulder height, weight, gender and age. These data can be used in the definition of animal populations and serve as basis for comparison with other periods (Clark, 1995; Guintard and Lallemand, 2003; Harcourt, 1974; Onar, 2005; Onar and Belli, 2005; Onar et al., 2002). Even though the definition of species and populations is widely based on measurements of mandibulas and teeth as they constitute the majority of animal remains at archaeological sites (Gingerich, 1977; Gingerich et al., 1982), other bones like the metapodium have been used to obtain information about an animal's morphology (Clark, 1995; Lallemand, 2002).

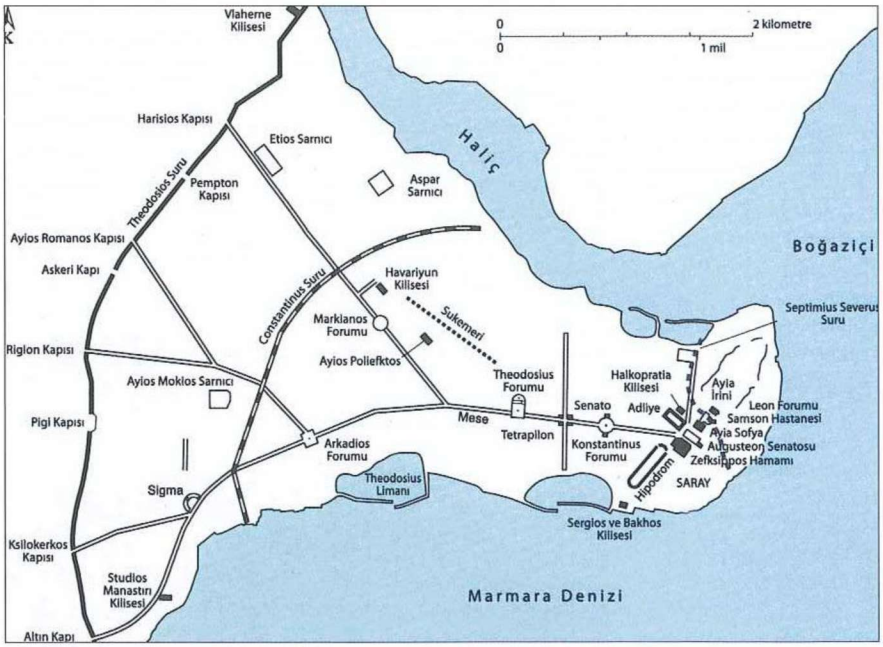

Figure 2. The Byzantine harbours (Haldon, 2006; as quoted Başaran, 2008).

Şekil 2. Bizans limanları.

Besides animal-specific information skeletal remains also provide important clues about the status of animals in human society and their relationship with them. But their contribution to ancient societies is not restricted to the economic and socio-cultural sphere; they also played a significant role in the military. In this context, the examination of animal remains excavated during the Metro and Marmaray construction projects at Yenikapı station in an ancient urban settlement will contribute to our knowledge about animal populations in the past and their relationship with man.

Materials and Methods

This study is an overview of the preliminary examination results of animal skeletons discovered during construction work for the subway station Yenikapı in connection with the Metro and Marmaray projects in Istanbul. The remains were classified by species and examined for pathologies, variations and traces of deliberate slaughter for consumption. On the basis of the results an attempt was made to interpret the animal population in Early and Late Byzantium.

Results

Scattered over the entire excavation area animal skeletons were found among other archaeological remains that could be attributed to a large number of different animals. Four species were most abundant: horses, sheep, bulls and pigs.

The excavation area is the largest ever in the historic part of today's Istanbul, formerly known as Byzantium, Constantinople or the "Second Rome", the seat of the successor to the Roman Empire that rose to be become the Byzantine Empire and the capital of yet another empire that was to follow it. The large number of archaeological finds in the ancient port area provides a rich addition in material objects, both natural and man-made, to the available written sources. They offer new and detailed insights into the socio-economic and the cultural life of this great empire.

The Marmaray Project, popularly known as Bosporus Tunnel Project, attempts nothing less than the connection of the two halves of Istanbul sitting on different continents by a tunnel under the Bosporus Straits. This project is, therefore, rightly called project of the century. Designed as an underground system it also provided a unique chance of digging deep into the historic layers of this ancient settlement. The Yenikapı station proved a treasure trove and work had to be halted there almost right from the beginning, causing a 3.5 year delay of the project. Systematic excavations of the site beginning in 2004 shed light on the earliest signs of human activity some 8000 years ago. On the 58000 m^2 area under investigation so far 37 ships and thousands of other objects of scientific interest have been discovered, including a large number of animal skeletons scattered over the entire area. Most bones are attributable to horses (*Equus caballus* L.) (Figure 3), followed by animals reared for consumption, labour or other purposes like bulls, sheep, goats, pigs and red deer, and camels. Besides land animals also numerous remains of birds (*Aves* sp.) and sea animals were found: species of fish (*Pisces* sp.), dolphins (*Delphinidae* sp.) and crabs (*Crustacea* sp.). For a summary of aquatic animal species and their distribution refer to Table 1.

Table 1. Aquatic animal species (fish-*pisces* sp.; dolphins-*delphinidae* sp.; crabs-*crustacea* sp.) and their distribution.

Tablo 1. Deniz hayvanlarının türleri (balık-*pisces* sp., yunus-*delphinidae* sp., yengeç-*crustacea* sp.) ve dağılımları.

Species
Tuna fish (*Thunnus thynnus* L.)
Swordfish (*Xiphias gladius* L.)
African catfish (*Clarias* sp.)
Shark (*Carcharhinidae* sp.)
European catfish (*Silirus* sp.)
Serranidae sp.-*Epinephelus* sp.
Sparidae sp.
Seabass (*Dicentrarchus labrax* L.)
Seabream (*Sparus aurata* L.)
Mackerel (*Scomber* sp. *ve sarda* sp.)
Crabs (*Crustacea* sp.)
Dolphins (*Delphinidae* sp.)

Among the fish species (*Pisces* sp.) tuna remains (*Thunnus thynnus* L.) were most abundant followed by swordfish (*Xiphias gladius* L.) and African catfish (*Clarias* sp.) (Figures 4, 5). The fish bones have obviously be cut with sharp tools (cleaver and knife traces could be detected) indicating that the animals were fished and processed for consumption.

Figure 3. A horse skeleton *in situ* (from left to right: Archaeologist Mehmet Ali Polat, Archaeologist Sırrı Çömlekçi, Archaeologist Emre Öncü and Prof.Dr. Vedat Onar).

Şekil 3. In situ at iskeleti (soldan sağa: Arkeolog Mehmet Ali Polat, Arkeolog Sırrı Çömlekçi, Arkeolog Emre Öncü ve Prof. Dr. Vedat Onar).

Figure 4. Tuna (*Thunnus thynnus* L.) remains unearthed from the Metro and Marmaray excavations.

Şekil 4. Metro ve Marmaray kazılarından ortaya çıkarılan Ton balığı (*Thunnus thynnus* L.) kalıntıları.

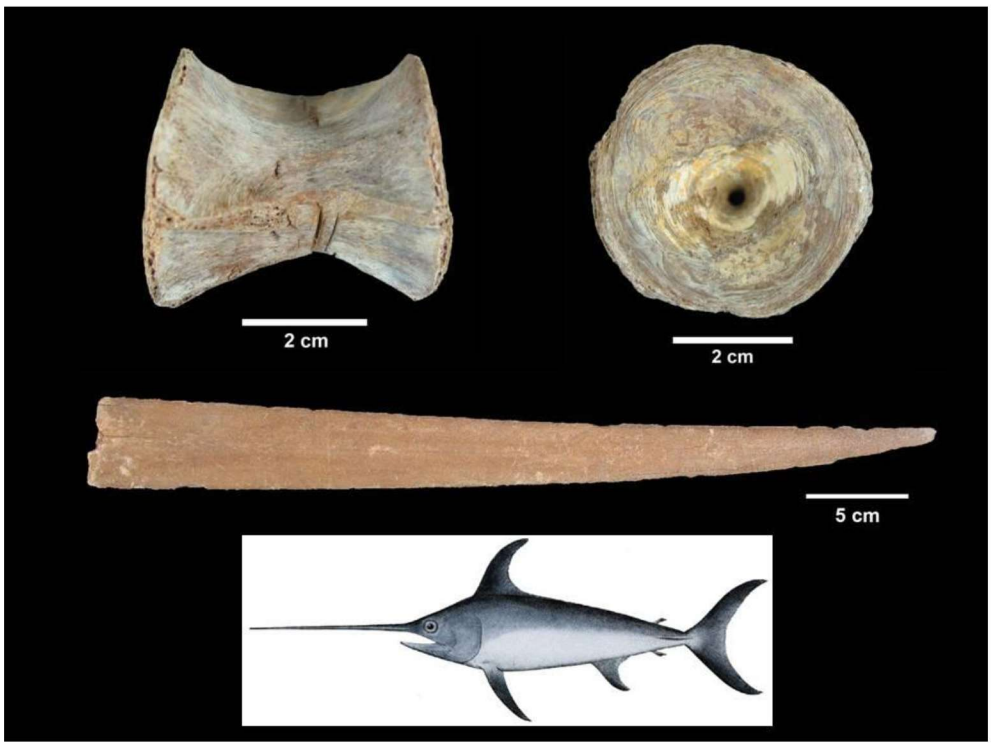

Figure 5. Swordfish (*Xiphias gladius* L.) remains unearthed from the Metro and Marmaray excavations.
Şekil 5. Metro ve Marmaray kazılarından ortaya çıkarılan Kılıçbalığı (*Xiphias gladius* L.) kalıntıları.

Most fish remains found in the excavation area were those of large species while smaller fish (sea bass, bream and bonito) were relatively rare. This led us to the assumption that large fish were processed and cut up in the harbour area while smaller fish species were transported unprocessed into the city.

The excavation also yielded a large number of skeletons of wild, domesticated and hunted land animals with bulls, buffaloes, sheep, goats and pigs most abundant. The skulls, in particular of bulls, sheep and goats exhibit traces made with sharp cutting tools obviously in an attempt to remove the brain (Figure 6).

Discussion

Since 2005, the Istanbul University Veterinary Faculty, Department of Anatomy has been working on the animal skeletons and bones excavated at Yenikapı the location of the ancient harbour of Theodosius. For this ongoing endeavour, the rectorate of Istanbul University has mobilised all its assets while the Research Council of Turkey, TUBITAK (Project number: 107O518), has provided project funds.

The bones were radiocarbon-dated (^{14}C) in 2008 using six bone samples in the previous study (Onar et al., 2008). The results show that the animal remains cover a time-span from Early Byzantium (4^{th} - 7^{th} century AD) to Late Byzantium (15^{th} century AB).

The excavation at Yenikapı has so far yielded approximately 50000 bones; they could be ascribed to 54 animal species. These findings provide important information about the scope of the animal populations in Byzantine times. The most abundant bone finds are attributable to horses with *Equus caballus* L. the dominant species. While some bones bear traces of butcher tools others seem to have been discarded after their death.

The Yenikapı area is the only known location with such a large number of Byzantine-era horse skeletons. Horses played an important role in the Byzantine Empire as its cavalry, the

backbone of the empire's military might, and the hippodrome in the centre of Byzantium – today's Sultanahmet square – attest. The remains at Yenikapı show that horses were used for many purposes besides carrying soldiers and pulling military equipment. However, the pathological findings allow the conclusion that the animals were not very well treated nor looked after well. We found, for example, widespread backbone deformations that are attributable to a wrong riding practice, and damages to the animals' jaws as a result of wrong bridle bit applications. These findings provide important clues to the way horses were kept and treated.

Figure 6. Slaughter marks on the bull's skull unearthed from the Metro and Marmaray excavations.
Şekil 6. Metro ve Marmaray kazılarından çıkartılan boğa kafasındaki kesim izleri.

As to the question why there were so many horse skeletons in that area we can think of two possible answers: the corpses of horses that had died of old age or disease may have simply been dumped in the silt of the Lykos brook that was slowly filling up the harbour, after any still useable parts like their skin, tail or mane had been removed. On 20 intact skeletons we found traces of cutting tools that point to such a recycling of body parts. Other horse bones show clear signs of having been cut up; this is in particular true for long bones (possibly to remove the marrow) and the skull (possibly to remove the brain). The traces are very likely the result of professional slaughter, dismembering and further processing. In the light of these findings it cannot be excluded that horse meat was an item on the menu of the inhabitants of Byzantium.

The skulls of other - more common - animals for human consumption like bulls, buffaloes, sheep and goats reveal cutting traces made with the intention of removing the brain. This finding points to the use of innards for consumption in old times. It is interesting to note that many skulls were opened with either a dorso-median cut or a horizontal cut as to remove the brain in one piece. This indicates a

professional approach, an established traditional method as it were.

The Yenikapı excavation also yielded a rich collection of fish bones. A large corpus of ancient texts refers to the fishing of tunas, swordfish and dolphins while the bonito is known as the symbol of Byzantium. The findings in the area neatly reflect the fishing habits related in old documents.

The animal remains found at Yenikapı constitute a veritable zoo with several deer species, wild goats, camels and even elephants as well as numerous species of fish and turtles. Also a numerous domestic pet animals were unearthed. In particular the many dog skeletons give us an idea of range of dog breeds (mesocephalic) and their size (small and medium-size) in Byzantine times. It can be concluded that dogs played an important role in the life of Byzantines.

Among the exotic finds are a primate skull and a mandibula of a young macaque monkey (*Macaca* sp.). The animal may have belonged to someone living in the harbour area. The cause of death could not be established.

The examination of the animal bones discovered at the excavation site continues at the Istanbul University Veterinary Faculty. The findings will allow us to draw a more detailed picture of the life in Byzantium and its development to modern-day Istanbul as well as to contrast both eras in the long history of this urban settlement. The Yenikapı excavation offers the unique opportunity to establish an animal inventory of Byzantium during its most active time. As such this project constitutes one of the best examples of inner city archaeology and will take its place as a leading example of research and teaching.

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