

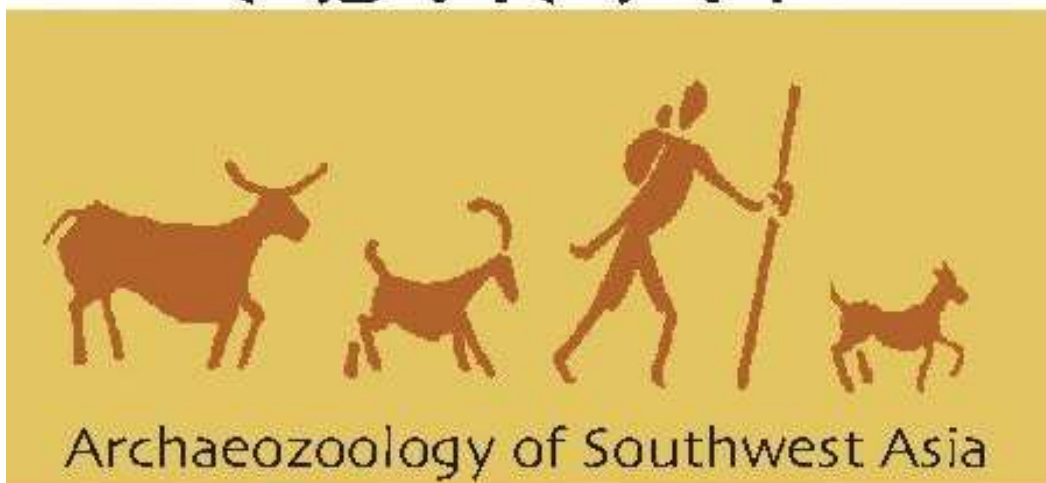
ARCHAEOZOOLOGY OF THE NEAR EAST VI

Proceedings of the sixth international symposium on the
archaeozoology of southwestern Asia and adjacent areas

edited by

**H. Buitenhuis, A.M. Choyke, L. Martin, L. Bartosiewicz
and M. Mashkour**

ASWA VI



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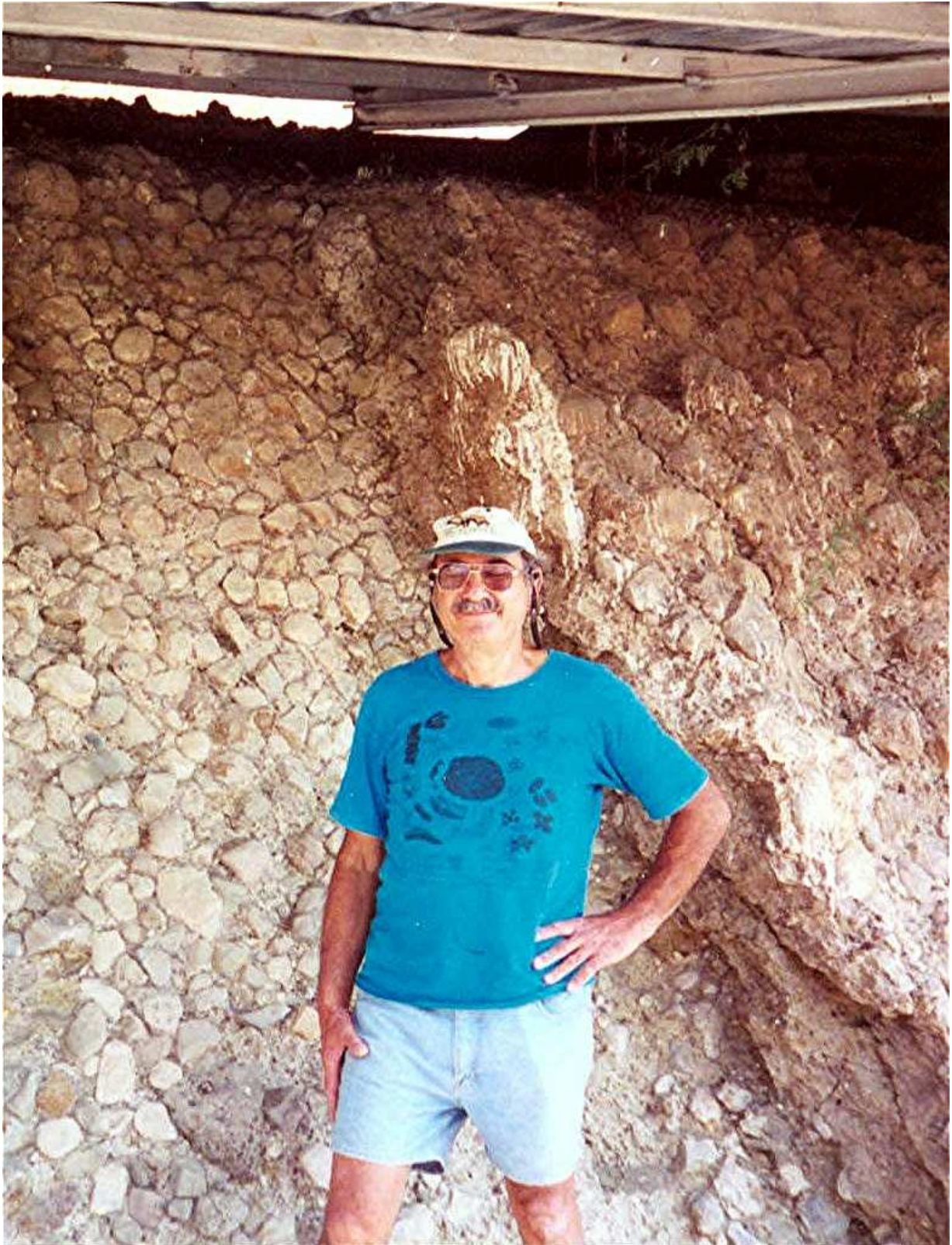
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Prof.Dr. Eitan Tchernov

This volume is dedicated to the memory of Prof. Dr. Eitan Tchernov, in fond memory of his enthusiasm and support to many in the field of archaeozoology.

Preface

The ASWA VI meeting was held at the Institute of Archaeology, University College London, from 30th August-1st September 2002, timetabled to follow on the heels of the ICAZ meeting in Durham, UK. Over 55 participants attended the meeting, travelling from 13 countries, bringing the latest research results from our field. As usual, it was a pleasure to see so many doctoral students presenting their research – a sign for a very healthy future for zooarchaeology in south west Asia. It is still unfortunate, however, that colleagues from some Middle Eastern countries were unable to attend due to financial and political constraints.

Presentations were organized into the following six themes, which highlight the scope of the ASWA membership: Animals in Palaeolithic and Epipalaeolithic Levant; Neolithic Patterns of Animal Use; Animals in Neolithic Anatolia; Animals in the Chalcolithic and Bronze Ages; Iron Age, Nabatean and Roman Patterns of Animal Use; Animals in Ancient Egypt. There was also a poster session, and contributors were invited to submit papers to this volume.

As always with the ASWA forum, the meeting served to welcome new scholars to the group, but was also very much a reunion of old friends and colleagues who have been sharing new information and discussing issues of joint interest for many years now. In this vein, it is a great sadness that ASWA VI was the last international meeting attended by Prof. Eitan Tchernov, an original founder of the group and mentor and inspiration to so many. For many of us, it was the last time we saw Eitan, and experienced his usual incisive comment, unstoppable enthusiasm for the subject, and warm friendship. He will be greatly missed.

ASWA VI was supported by the Institute of Archaeology, UCL, who provided facilities and financial and administrative help. In particular, the organizing team was aided greatly by the administrative assistance of Jo Dullaghan at the Institute. ARC bv (Archaeological Research and Consultancy, Groningen, The Netherlands) once again shouldered the finances of the publication of the proceedings, and we are extremely grateful for their continuing support. Many thanks are also due to the post-graduate student helpers from the Institute of Archaeology who made the meeting run so smoothly: Banu Aydinoğlugil, Jenny Bredenberg, Chiori Kitagawa, Peter Popkin, and Chris Mosseri-Marlio (who also produced the logo reproduced on the frontispiece of this volume).

Many thanks to all the participants for making the meeting such a success!

Louise Martin
London 2005



Participants of the 6th ASWA Conference, held at the Institute of Archaeology, University College London.

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ANIMAL REMAINS FROM THE EXCAVATIONS OF HORUM HÖYÜK, SOUTHEAST ANATOLIA, TURKEY

László Bartosiewicz¹

Abstract

Horum Höyük is a tell site located north of the modern border between Turkey and Syria. It lay less than 200 km west of the north-western corner in the Asiatic coastline of the Mediterranean Sea, along the Euphrates. Over two thirds of the more than 10,000 identifiable bones originated from the Late Chalcolithic. The next largest chronological sub-sample made up only 16% of all fragments. Although the Early Bronze Age was represented by 10% of the bones, the rest of the periods (Iron Age, AD 12-13th c.) contributed only a few percentage points to the overall NISP. While there is no pronounced diachronic variability, some tendencies fall in line with observations made at other, coeval sites in the area. The increasing importance of sheep and goat are most noteworthy, a trend often attributed to the emergence of more complex structures and urban centres in the area.

Resumé

Horum Höyük est un tell situé au nord de la frontière actuelle entre la Turquie et la Syrie. Il se trouve à 200km à l'ouest de l'angle nord ouest des rivages asiatiques de la Méditerranée, le long de l'Euphrates. Plus de deux tiers des 10000 restes identifiés sont issus des niveaux chalcolithiques. Même le plus grand sous-assemblage chronologique faisait que 16% de tous les restes. Bien que le Bronze ancien soit représenté par 10% des os, les autres périodes contribuent proportionnellement très peu au NISP. Alors qu'il n'y a pas de variabilité diachronique très prononcée, quelques tendances se voient confirmées par les observations faites sur d'autres sites contemporains de la région. L'importance de mouton et de la chèvre est à surtout à souligner, une tendance qui est souvent attribuée à l'émergence de structures complexes et des centres urbains dans la région.

Keywords: Southeast Anatolia, Chalcolithic, Bronze Age, deforestation, urbanism.

Mots Clés: Sud est de l'Anatolie, Chalcolithique, Age du Bronze, déforestation, urbanisation.

Introduction

Four campaigns of rescue excavations were carried out at Horum Höyük between 1996 and 1999 before the Euphrates valley was flooded by the Birecik dam 2000 (Marro *et al* 1997 to 2000). This paper is an overview of animal remains from rescue excavations at the tell site of Horum Höyük in southern Turkey, at the current level of archaeological evaluation. To date, 10,153 of the 14,807 animal remains analysed have been successfully assigned to datable strata. Much of the remaining c.a. 30% of the material may still turn out to be archaeologically identifiable, although animal remains from chronologically mixed layers are ill-suited for evaluation. In contrast to sherds, whose style may provide a basis for typo-chronological dating, animal bones identified on a morphological basis offer information that can only be interpreted in light of valid archaeological phasing. Although the occurrence of certain species (e. g. early domesticates) may be diagnostic from a culture historical point of view, considering animal remains as *a priori* chronological markers could lead to circular reasoning. This archaeozoological evaluation is thus based on material whose chronological position could be clearly ascertained.

Location and natural environment

Horum Höyük lay less than 200 km west of the north-western corner in the Asiatic coastline of the Mediterranean Sea, along the north to south section of the Euphrates River that largely corresponds to the boundary between the Mediterranean and Eastern Anatolian Climatic zones (Izbirdak 1976: 97).

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The latter is understandably more continental in character. In the environment of the site this east-west climatic interface is further complicated by a north-south ecotone: the terrain is characterised by rolling hills, as mountains in the north meet the Syrian Desert to the south. This ecotone therefore has a relatively mild climate (Izbirak 1976: 109), even if modern-day mean annual precipitation is only 350-500 mm (Izbirak 1976: 81). Summers tend to be hot and dry here. The floodplain of a major river, however, offered a very favourable habitat for plants, animals and human settlement alike.

Prior to inundating the studied section of the Euphrates Valley within the framework of the recent hydroelectric project, the site of Horum Höyük was located on the right bank of the river which, flowing south, cuts into the tertiary deposits of the undulating hilly region of southeastern Anatolia (Izbirak 1976: 29), before crossing the present day political border between Turkey and Syria. This alluvial plain falls within what has been known classically as the “Fertile Crescent” formed by the Zagros and Taurus Mountains (Peake and Fleure 1927).

The tell was surrounded by a settlement. The tell itself covers an area of over 6 ha, although half of it has been washed away by the river. Surface finds indicate that the lower settlement was established during the Roman Period. This area, however, could not be excavated owing to the lack of time and legal difficulties. Field surveys indicate that Horum Höyük may have covered a total of 21 ha (Algaze *et al* 1994).

The zoological material

Owing to rather good preservation, 80% of the over 10,000 datable animal bones could be identified, mostly to species, but at least to family level. These 8291 identifiable specimens (NISP) make up 55.9% of the assemblage analysed (Fig. 1). It is this portion of the material that could be used in reconstructing ancient meat diets, and in fact, animal keeping in various time periods at the site.

The numbers of animal remains varied broadly between the periods represented in the assemblage (Fig. 2). Over two thirds originated from the Late Chalcolithic, attested in trenches D and E where a 6 m deep well (D0012), some 3 m in diameter, was found. Once abandoned, this well was used as a refuse-pit and filled in during the first half of the 4th millennium. It was excavated in two halves, the western part stratigraphically, by archaeological layers.

The next largest chronological sub-sample made up only 16% of all fragments. Although the Early Bronze Age was still represented by 10% of the bones, the rest of the periods contributed only a few percentage points. The Bronze Age levels show a continuity of the material culture throughout the 3rd and early 2nd millennium. The small medieval sample, on the other hand, is completely separate from the prehistoric assemblages. These numbers are detailed by taxonomic and chronological sub-division in Table 1.

As may be seen in this table, a greater variety of animal species came to light from chronological units that are represented by large numbers of identifiable bones. Species composition i.e. taxonomic richness, therefore, is difficult to compare directly between samples of greatly differing sizes. The results thus obtained would be more characteristic of NISP than the differential richness of the samples studied: smaller assemblages are more likely to contain fewer species, and when samples are drawn in a perfectly random fashion, the least frequent species will be the last to occur (Grayson 1984: 137). This is clearly illustrated by the remains of rare animals in Table 1, which shows that they tend to be better represented in large samples, such as the Late Chalcolithic and Middle Bronze Age sub-assemblages at Horum Höyük.

The stochastic relationship between the number of identifiable specimens (NISP = x) and the number of species represented in an assemblage (R = y) is best expressed by the linear regression between the decimal logarithms of these two variables for the chronological sub-assemblages listed in Table 1 (Fig. 3). The trend shown in this graph may be described using the following equation:

$$\log R = 0.268 \log \text{NISP} + 0.362 \quad (r = 0.897)$$

Table 1. The taxonomic and chronological distribution of animal remains from Horum Höyük (BA= Bronze Age, IA= Iron Age).

Species	Late Chalcolithic	Late Uruk	Early BA	Middle BA	Early IA	AD 12-13th c.	Total
Cattle (<i>Bos taurus</i>)	313	14	108	245	49	27	756
Sheep (<i>Ovis aries</i>)	345	7	76	65	28	13	534
Goat (<i>Capra hircus</i>)	345	5	49	106	28	8	541
Sheep/goat (<i>Caprinae</i>)	3677	42	443	586	137	69	4954
Pig (<i>Sus domesticus</i>)	599	20	136	212	24	18	1009
Horse (<i>Equus caballus</i>)				2		5	7
Domestic ass (<i>Equus asinus</i>)				2	2	8	12
Dog (<i>Canis familiaris</i>)	112		3	13	3	11	142
Domestic total	5391	88	815	1231	271	159	7955
Aurochs (<i>Bos primigenius</i>)	31	1	1	8			41
Wild sheep (<i>Ovis orientalis</i>)	23		1		3		27
Red deer* (<i>Cervus elaphus</i>)	8		6	25		3	42
Fallow deer* (<i>Dama mesopotamica</i>)	4	4		4	2		14
Gazelle (<i>Gazella subgutturosa</i>)	15		11			5	31
Wild ass (<i>Equus cf. hemionus</i>)	4		4	4	1		13
Equid (<i>Equidae</i>)			2	3	1	1	7
Wild pig (<i>Sus scrofa</i>)	38		2	2	2	1	45
Hare (<i>Lepus capensis</i>)	7		2	2		2	13
Red fox (<i>Vulpes vulpes</i>)						6	6
Mustelid (<i>Mustela nivalis</i>)	20						20
Stone marten (<i>Martes cf. foina</i>)				1			1
Cat (<i>Felis sp.</i>)	2			1			3
Hamster (<i>Cricetus cricetus</i>)	1						1
Large rodent (<i>Hystrix?</i>)	1						1
Small rodent (<i>Rodentia</i>)	6			1			7
Wild total	160	5	29	51	9	18	271
Pond tortoise (<i>Emys orbicularis</i>)	1			1			2
Carp (<i>Cyprinus carpio</i>)	1			1			2
Carp family (<i>Cyprinidae</i>)	4		2	1			7
Crustacean (<i>Crustacean</i>)	1						1
Riverine mussel (<i>Unio sp.</i>)	9		1	3			13
Aquatic total	16		3	6			25
Total identifiable (NISP)	5567	93	847	1288	280	177	8251
Large mammal (<i>Mammalia indet.</i>)	131	2	29	91	33	5	291
Small mammal (<i>Mammalia indet.</i>)	1167	14	149	156	26	23	1535
Bird non-id. (<i>Aves indet.</i>)	11			12		2	25
Fish non-id. (<i>Pisces indet.</i>)	9		1	1			11
Total non-id.	1318	16	179	260	59	30	1862
Red deer antler	11		3	13			27
Fallow deer antler			9		2		11
Human	1			1			2
TOTAL	6897	109	1038	1562	341	207	10153
* Excluding antler							

The high and significant correlation ($P \leq 0.01$) as well as the low regression coefficient indicate that the recovery of bones from each new species follows a clearly degressive trend. The number of species represented in a sample of 500 bones is approximately 12 which includes all domestic species at this site, although more unusual animal remains can be expected only in large assemblages.

Within the general tendency described by the equation, the small AD 12-13th century assemblage and the relatively large Middle Bronze Age assemblage seem to be relatively richer. On the other hand, the bones of sheep and/or goat tend to be over-represented in other assemblages. The dominant Late Chalcolithic and the small Late Uruk period assemblage (NISP < 100) are similar in this regard. They fall below the regression line that represents the average number of taxa that can be expected on the basis of sample size (Fig. 3).

Urban sites are often characterised by a limited choice of animal species. Crabtree (1990: 160) illustrated this trend by prehistoric examples from the Middle East. She also emphasised, however, the apparently great variability between sites in this regard.

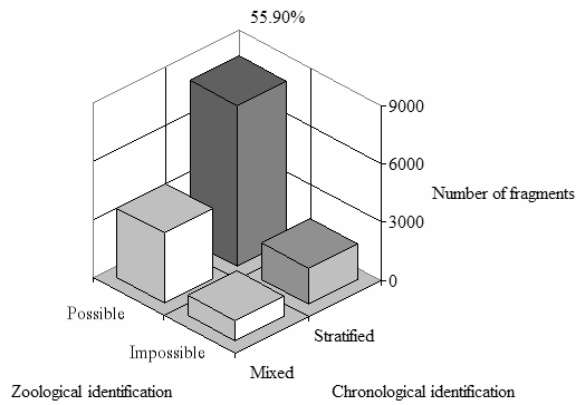


Fig. 1. Distribution of the Horum Höyük animal remains by identifiability (NISP used in the study make up 55.9% of the entire material).

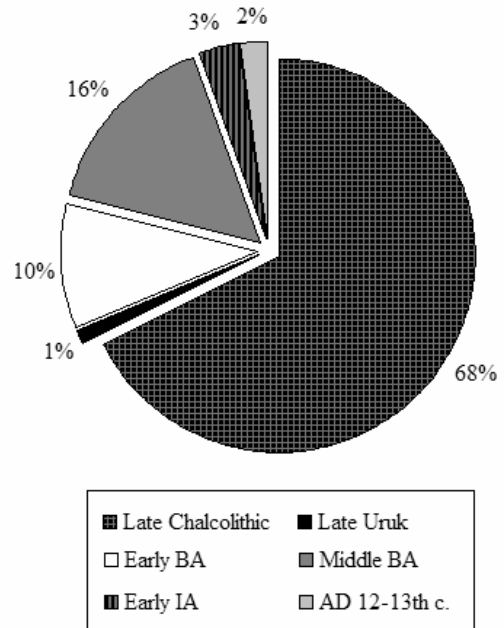


Fig. 2. The chronological composition of the Horum Höyük assemblage (NISP).

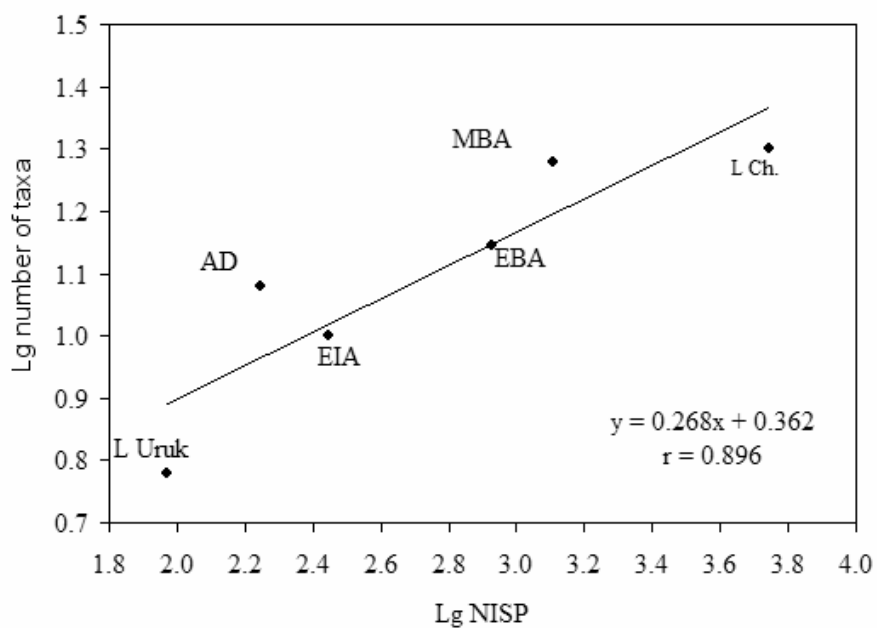


Fig. 3. Relationship between sample size and taxonomic richness.

Table 2. The percentage distribution of NISP values by period.

Species	Late Chalcolithic	Late Uruk	Early BA	Middle BA	Early IA	AD 12-13th c.
Cattle (<i>Bos taurus</i>)	5.6	15.1	12.8	19.0	17.5	15.3
Sheep (<i>Ovis aries</i>)	6.2	7.5	9.0	5.0	10.0	7.3
Goat (<i>Capra hircus</i>)	6.2	5.4	5.8	8.2	10.0	4.5
Sheep/goat (<i>Caprinae</i>)	66.0	45.2	52.3	45.5	48.9	39.0
Pig (<i>Sus domesticus</i>)	10.8	21.5	16.1	16.5	8.6	10.2
Horse (<i>Equus caballus</i>)				0.2		2.8
Domestic ass (<i>Equus asinus</i>)				0.2	0.7	4.5
Dog (<i>Canis familiaris</i>)	2.0		0.4	1.0	1.1	6.2
Domestic total	96.8	94.6	96.2	95.6	96.8	89.8
Aurochs (<i>Bos primigenius</i>)	0.6	1.1	0.1	0.6		
Wild sheep (<i>Ovis orientalis</i>)	0.4		0.1		1.1	
Red deer* (<i>Cervus elaphus</i>)	0.1		0.7	1.9		1.7
Fallow deer* (<i>Dama mesopotamica</i>)	0.1	4.3		0.3	0.7	
Gazelle (<i>Gazella subgutturosa</i>)	0.3		1.3			2.8
Wild ass (<i>Equus cf. hemionus</i>)	0.1		0.5	0.3	0.4	
Equid (<i>Equidae</i>)			0.2	0.2	0.4	0.6
Wild pig (<i>Sus scrofa</i>)	0.7		0.2	0.2	0.7	0.6
Hare (<i>Lepus capensis</i>)	0.1		0.2	0.2		1.1
Red fox (<i>Vulpes vulpes</i>)						3.4
Mustelid (<i>Mustela nivalis</i>)	0.4					
Stone marten (<i>Martes cf. foina</i>)				0.1		
Cat (<i>Felis sp.</i>)				0.1		
Hamster (<i>Cricetus cricetus</i>)						
Large rodent (<i>Hystrix?</i>)						
Small rodent (<i>Rodentia</i>)	0.1			0.1		
Wild total	2.9	5.4	3.4	4.0	3.2	10.2
Pond tortoise (<i>Emys orbicularis</i>)				0.1		
Carp (<i>Cyprinus carpio</i>)				0.1		
Carp family (<i>Cyprinidae</i>)	0.1		0.2	0.1		
Crustacean (<i>Crustacean</i>)						
Riverine mussel (<i>Unio sp.</i>)	0.2		0.1	0.2		
Aquatic total	0.3		0.4	0.5		
Total identifiable (NISP)	100.0	100.0	100.0	100.0	100.0	100.0

* Excluding antler

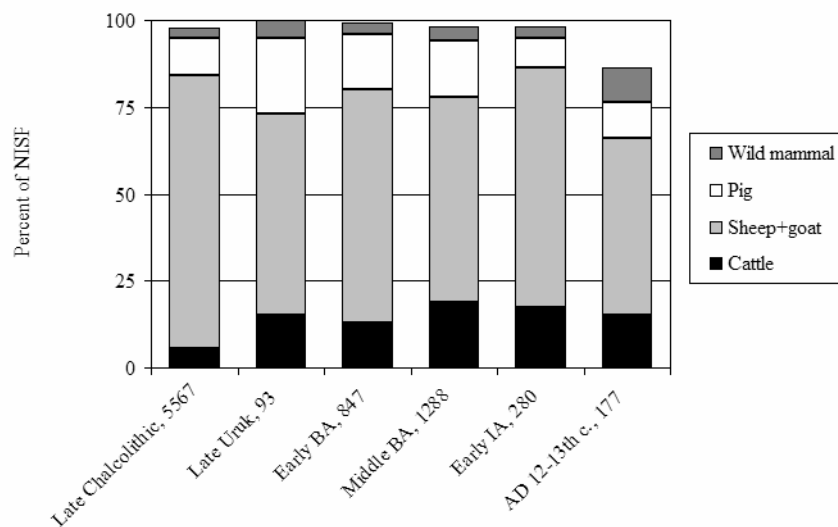


Fig. 4. Diachronic changes in the percentage contribution of characteristic mammals (NISP) at Horum Höyük.

Although sample size directly affects the interpretation of ratio values, the numbers of identifiable bone specimens (NISP) were converted into percentages by periods (Table 2). Keeping differences in sample size in mind, percentages offer an easily interpretable view of relative species frequencies. Looking at the changing proportions between the numbers of bone fragments from cattle, sheep and goat, pig, as well as wild mammals (Fig. 4), only slight diachronic changes may be detected (size differences between the bars shown in this graph result from the presence of dogs, horse and other domesticates that were not typically exploited for meat). Most importantly, domestic mammals included in Figure 4, make up some 95% of the identifiable animal remains in all periods. The only exception is the small and chronologically discontinuous AD 12-13th century assemblage to which the relative contributions of rare bones from game and non-meat purpose domesticates is the largest. Even this way, however, even-toed species dominated the small medieval sample at almost 90%.

Over two thirds of the large Late Chalcolithic sample are made up of the remains of sheep and goat, dominating largely at the expense of cattle and, to some extent, pig. In all periods, the contribution of wild animal remains (without deer antler, a material that can be gathered without killing the animal) was below the minimum level of 10%, theoretically expected at sites characterised by subsistence hunting. The same tendency was observed, for example, at the tell site of Arslantepe in Central Anatolia, where the bones of wild animals were rare in the food refuse, and even those that occurred often belonged to exotic game animals (Bökönyi 1985, 1993; Bartosiewicz 1998), probably killed within the framework of prehistoric “luxury” hunting. This is consistent with the hypothesis that large game were of great cognitive importance in the community’s imagery. Five of the stamp-seals recovered from the well were marked by animals, including two cervids, a boar and two equids (Marro *et al* 1999: pl. XI/9; Marro *et al* 2000: pl. X/1-2), although the wild status of the latter is impossible to prove.

In order to appraise the validity of differences observed in the percentage composition of chronological sub-samples, a Chi square test was carried out to test the diachronic heterogeneity of taxonomic distributions. As part of this calculation, theoretical values (T) have been calculated from the observed NISP values (O) listed in Table 1. The advantage of these calculations is that they look at differences in taxonomic composition in light of sample size. Boldface print was used in Table 3 to mark values greater than their observed/theoretical counterparts.

Table 3. Observed and theoretical NISP values by major domestic taxa and sub-assemblages.

Species	Late Chalcolithic		Late Uruk		Early Bronze Age		Middle Bronze Age		Early Iron Age		AD 12-13th century		Total
	O	T	O	T	O	T	O	T	O	T	O	T	
Cattle	313	512.1	14	8.5	108	78.8	245	117.8	49	25.8	27	13.1	756
Sheep/goat	4367	4084.0	54	68.1	568	628.1	757	939.1	193	205.8	90	104.4	6029
Pig	599	683.4	20	11.4	136	105.1	212	157.2	24	34.4	18	17.5	1009
Total	5279	5279	88	88	812	812	1214	1214	266	266	135	135	7794

The visual pattern of these values suggests that the contribution of sheep/goat bones at the expense of cattle and pig remains was far greater in the large Late Chalcolithic assemblage than expected. The opposite of this trend is characteristic for the rest of the chronological sub-samples in which cattle and pig seem to be more common than expected.

Observed and theoretical values summarised in Table 3 result in a Chi Square = 379.4 which is indicative of a homogeneous distribution at practically any level of probability. This means that the large Late Chalcolithic sample, with its high contributions of sheep and goat, dominates the entire assemblage of the site. It biases the overall picture in a sense that, compared to this large sub-assemblage, the presence of sheep and goat remains looks less than expected on a theoretical basis. This difference, however, is not significant statistically. Indubitably, sheep and goat were the most characteristic providers of meat at the site in *all periods*.

Cattle (Bos taurus)

Cattle is considered one of the most important domesticates in many economies. Demand for the multitude of products (meat, hide, milk, draught power) from this slow-growing, uniparous animal, made cattle a basic element of stock keeping in many prehistoric communities. It seems, however, that beef played a relatively minor role in the meat supplies of Horum Höyük, and it may be speculated that exploiting live cattle for so-called secondary products was at least as important as slaughtering animals for food. This hypothesis is supported by the steady 10-20% contribution of cattle bones in all studied periods and the fact that most of these remains originate from mature animals that may have been slaughtered at the end of their productive lives. In addition, at least one Early Bronze Age cattle metatarsus showed extreme asymmetry at its distal end, which may be interpreted as a sign of functional hypertrophy caused by hard work such as ploughing (Bartosiewicz *et al* 1993). While there is no way to prove that cattle were used in tillage, the importance of plowland cultivation at Horum Höyük was clearly illustrated by the evidence of cereal grain from six row barley and a variety of wheat types (Herveux 2001: 24).

Sheep (Ovis aries) and goat (Capra hircus)

Ratios of NISP between sheep and goat are largely equal, showing only minor diachronic variability. The only exception is the Middle Bronze Age sample, in which goat remains are almost twice as common as those of sheep (Fig. 5). Given the relatively large size of this sample this phenomenon is noteworthy. Unfortunately, this difference is swamped by the relatively great number of Caprine bones that could not be identified to species either as sheep or goat (Bartosiewicz 1999a: 54). Most sheep remains are indicative of relatively small individuals with meagre horn cores. This tendency was so strong that a few unusually large bone specimens were considered the remains of wild sheep (*Ovis orientalis*), the ancestor of domestic sheep, native to the Fertile Crescent.

Six Chalcolithic and one Early Bronze Age goat horn cores were twisted, a morphological feature widely associated with relatively advanced domestication. The left scapula of a Late Chalcolithic goat showed lipping on the ventral edge of the articular surface, possibly related to the inflammation of the shoulder. The presence of adult and mature individuals among goats may be an indirect sign of milk production, i.e. of animals kept to an old age, as long as they could be profitably exploited for milk.

Pig (Sus domesticus) and wild pig (Sus scrofa)

Pig is often considered an “index species” of pivotal importance, especially in the Near East where our image of meat consumption is somewhat influenced by historical information on the avoidance of pork by various communities. During prehistory, however, a clear taboo against eating pigs does not seem to have existed. Therefore, the presence of pigs may be considered as being more characteristic of the landscape than of cultural prejudice.

Undoubtedly, the natural setting of Horum Höyük was better suited for the keeping of sheep, goat and cattle. Nevertheless, pig was consistently represented in all chronological sub-assemblages, and its role as a meat supplier apparently remained constant. This is indicative of a sufficiently humid and possibly forested habitat that could be exploited by pig keeping in the floodplain area. The role of pigs as climatic indicators can be seen relatively clearly in the region. For example, the proportion of pig bones reached a comparably high value in the Chalcolithic at the site of Arjoune, located at the western edge of the Syrian Desert (SW of Horum Höyük), where a Mediterranean climatic influence is apparent (Grigson 2000: 13). Meanwhile, at the site of Habuba Kabira on the right bank of the Euphrates in Syria, pig keeping never gained much significance in coeval periods, probably owing to the arid conditions (von den Driesch 1993: 53). Pig, on the other hand, is entirely missing from arid sites such as El Kowm 2 - Caracol (4th millennium BC), located 100 km south of the Euphrates in Syria (Vila 1998: 120-121). This settlement, however, was located outside the river valley environment preferred by Uruk inhabitants. It is also characterised by a high contribution of bones from game and Equids, mostly identifiable as wild asses (Vila 1998: 123, Fig. 3).

In addition to characterising habitat types, however, the contribution of pig to animal bone assemblages varies with socio-cultural events in the region. For example, a sharp decline in pork consump-

tion was seen by the Early Bronze Age at Tell Afis in Syria (Wilkens 2000: 30), although it is not possible to tell whether this was primarily the result of changes in the human (i.e. socio-economic) environment, or a secondary phenomenon caused by continuous deforestation.

The occurrence of some very large Suid remains in the material has been interpreted as evidence for hunting wild boar. The presence of this large game animal in all periods represented in the assemblage indicates that the natural habitat around the site was favourable for pigs and was, in fact, humid and bushy enough to sustain populations of wild boar.

Horse (Equus caballus) and domestic ass (Equus asinus)

The remains of domestic Equids are most likely to occur in the later periods of the site. In the Near East, many Bronze Age large Equid bones can be identified as those of horse (e.g. Al-Zawahra and Ezzughayyar 1998: 133). According to Von den Driesch (1993: 53), the presence of donkey was established at the site of Habuba Kabira in Syria in the last phase of the Uruk Period or in the first phase of the Early Bronze Age. Similarly, extremely gracile Middle Bronze Age and AD 12-13th century Equid bones were attributed to domestic donkeys at Horum Höyük. It must be mentioned, however, that numerous non-characteristic fragments of medium size Equids may equally originate from wild ass in prehistory, as well as small horses or even mules and/or hinnies in later periods.

Dog (Canis familiaris)

Since dog meat does not seem to have formed part of the diet during the long history of Horum Höyük, the bones of these animals occur relatively sporadically, sometimes articulated. The otherwise small contribution of dogs, however, steadily increases throughout the stratigraphic sequence, up to 6% during the Middle Ages. While most prehistoric dog bones originate from non-distinct, pariah dog-like individuals, medieval dogs from Horum Höyük were somewhat larger.

In all periods, only about 0.5% of the bones showed unambiguous marks of dog gnawing. The scarcity of this indirect evidence shows that dogs must have been of limited importance at the site.

Aurochs (Bos primigenius) and wild sheep (Ovis orientalis)

These two Bovid species belonged to the natural habitat of the settlement, with their preference for open grassland and rolling hilly country. Their identification was simply based on the large size of cattle and sheep bones, some of which were far too large to represent prehistoric domestic animals. The hunting of these large game seems even more likely, since owing to the apparently advanced state of domestication at this settlement, individuals of transitional size (potentially indicative of crossings between the wild and domestic forms) did not occur. Bones of large cattle and sheep, therefore, could be considered as originating from hunting large game.

Gazelle (Gazella subgutturosa)

In addition to the aforementioned two bovid species whose domestic descendants were well represented in the domestic stock, gazelle is also indicative of an open grassland environment. Although owing to the limited importance of hunting the diachronic increase in the percentage contribution of this species was not statistically significant, it coincides with other zoological signs of deforestation (Fig. 5).

Red deer (Cervus elaphus) and fallow deer (Dama mesopotamica)

Both deer species identified at this site are indicative of open, parkland forests. In addition to antler remains (that may have been acquired by collecting or even trade), the bones of these animals prove that hunting was practised by the inhabitants of an otherwise agricultural settlement during prehistory. Deer antler was not only found in a worked form, but complete red deer antlers were also deposited at the bottom of Feature 12 in Square D.

Wild ass (*Equus c.f. hemionus*) and other Equids (*Equidae*)

Distinction between the bones of wild ass and its domestic variety is practically impossible. In earlier periods, however, the hunting of wild ass is a more likely interpretation of bones from small Equids. In a detailed osteometric study Vila (1998: 123, Fig. 3) identified most 4th millennium BC Equid bone from El Kowm 2-Caracol as those of wild ass. Relatively large Chalcolithic and Bronze Age bones of small Equids were thus tentatively identified as remains of wild ass at Horum Höyük as well.

Wild carnivores

Articulated skeletal remains of red fox (*Vulpes vulpes*) may possibly originate from natural deaths in the case of these burrowing animals. In the absence of marks left by defleshing or skinning, it is difficult to interpret the way these animals had been exploited. Remains of a small Mustelid were identified as the bones of weasel (*Mustela nivalis*), the smallest carnivore in the region. The femur of this specimen was 33 mm long, somewhat larger than those from other Middle Eastern sites cited by Van Es (1998: 118, Table 1) and Boessneck (1995: 123). Bökönyi (1990: 82) also mentions the possibility that the bones of this species may be considered intrusive in archaeological provenances, since weasels prefer rocky habitats in the proximity of rivers, and man-made stone structures in abandoned settlements may have been ideal hideouts for these animals. This possibility is supported by the fact that bones of small carnivores came to light in clusters, a possible sign of natural deposits.

Sporadic bones originated from stone marten (*Martes cf. foina*) and a small (possibly wild) cat (*Felidae*). It is noteworthy, however, that most of these rare bones occur in the largest, Chalcolithic, assemblage of Horum Höyük. Therefore, their diachronic representation is difficult to appraise owing to unequal sample sizes.

Lagomorphs and rodents

The remains of hare (*Lepus capensis*) and hamster (*Cricetus cricetus*) are typical species of the Eurasian grassland that have sporadically been exploited for meat and fur (Bartosiewicz 1999b). A large tibia fragment possibly originates from porcupine (*Hystrix?*), while a few bones from non-identifiable small rodents (*Rodentia*) were also recovered. The majority of these remains occurred in the largest chronological sub-assemblages (i.e. represented as a function of sample size), although the coincidence of higher percentages of hare bone with those of gazelle in the AD 12-13th century assemblage

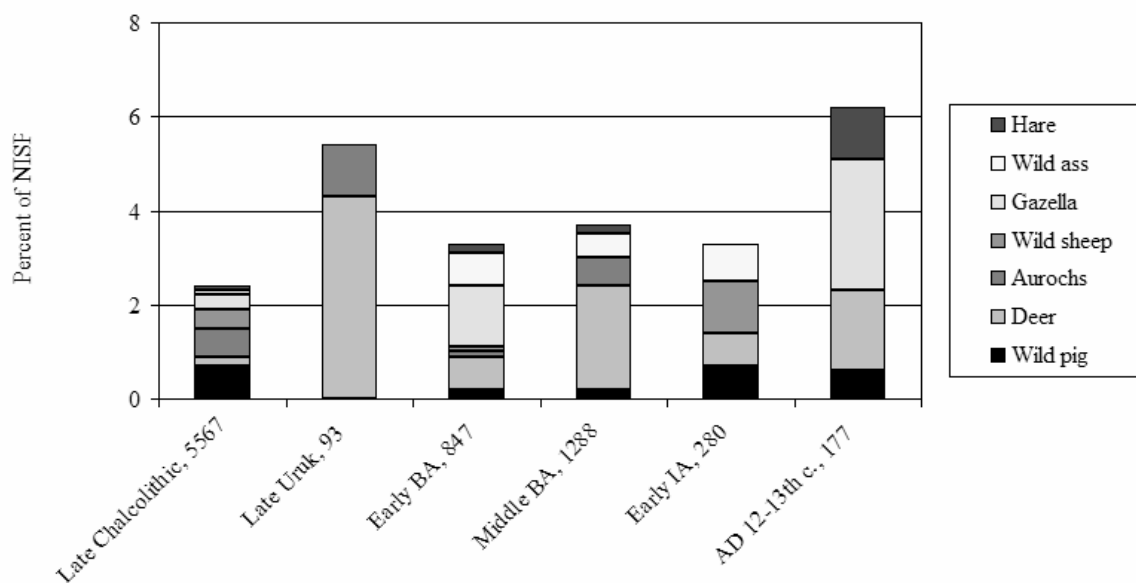


Fig. 5. Diachronic changes in the contribution of major game animals (NISP) at Horum Höyük.

seems to reconfirm the historically known expansion of grassland habitats around the settlement.

Aquatic animals

Remains of pond tortoise (*Emys orbicularis*) may also originate from natural deposits, since none of these bones show cutmarks or any other sign of human interaction. In any case, they illustrate the humid conditions that existed in the floodplain area.

Fishing in the nearby river must have been a major source of animal remains, although this hypothesis is impossible to test in the absence of water-sieved samples. The majority of identifiable fish (*Pisces*) remains represent the carp family (*Cyprinidae*), and carp (*Cyprinus carpio*) especially. A small claw fragment most probably originates from river crab (*Potamon* cf. *potamius*), although this hypothesis cannot be refined or even verified in the absence of reference material. Fragments of riverine mussel (*Unio* sp.) were also recovered.

Bone manufacturing

Considering the prehistoric origins of this assemblage, only a few pieces of worked bone were found among the zoological finds. Although the detailed analysis of bone artefacts is beyond the scope of this paper, a brief description is provided here. The bone types are based on Schibler's typology (1981).

Worked specimens in the refuse bone assemblage included two Late Chalcolithic bone points made from a sheep metacarpus and metatarsus that were of medium size (Schibler, 1981: Type 1/8). The metatarsus belonged to a large, possibly wild specimen. Another sheep/goat metatarsus diaphysis fragment was carved into a small Type 1/7 point. A Late Chalcolithic cattle rib scraper was also recovered.

A medium size point (Type 1/8) was also found in the Early Bronze Age sub-assemblage; it was made on a tibia splinter with worked butt end. An Early Bronze Age cattle ulna perforator (Type 1/5) with four transversal decorative incisions on its back (caudal) side was also brought to light at the site. Another Early Bronze Age point (Type 1/1) was carved from the distal half of a sheep or goat metatarsus, using the "groove and split" technique, by which the fused 3rd and 4th metapodia of ruminants are often separated prior to sharpening. Probably the same type of fine perforator is represented by a Middle Bronze Age bone tool fragment carved using flint.

A Middle Bronze Age red deer metatarsus was carved into a large, dull perforator (Type 1/6). This tool may show a preference for high quality deer bone, a valuable raw material at a site where hunting was of limited significance.

Among the worked pieces of antler, a "T"-shaped "axe" and a simple handle made from tine were recovered from the Chalcolithic material of Feature D 12. A fallow deer antler blank, cut with flint and snapped was found in the Early Iron Age material.

Finally, the huge Chalcolithic assemblage contained a goat astragalus bone whose lateral side had been carved flat and also showed high polish, possibly caused by handling. These bones often served as dice in board games.

Conclusions

While there is little diachronic variability in the taxonomic composition of prehistoric assemblages from Horum Höyük, some tendencies fall in line with observations made at other, coeval sites in the area. Of these, the increasing importance of sheep and goat are most noteworthy, which is a trend often attributed to the emergence of more complex structures and urban centres in the area. The greater concentration of human populations was also accompanied by increasing deforestation, and the resulting clearing gave place not only to agricultural land but also pasture, predominantly exploited by sheep and goat.

According to Bökönyi (1988), following the Late Chalcolithic, remains of sheep became increasingly common at Arslantepe in Central Anatolia. The dominance of small ruminants was even clear in the otherwise small Late Bronze Age II (LBA II) as well as the Neo-Hittite (NH) sub-assemblages at that site. In fact, a slight decrease in the prominence of cattle in several regions and a concomitant increase of the importance of sheep and goat occurred across the entire region during the Bronze Age (Clason and Buitenhuis 1998: 240).

Historically, grazing in forests has been very important in Turkey, with goats having a leading role in exploiting woodland this way (Izbirak 1976: 131). Intensive grazing by small ruminants further precluded the recovery of forests, thereby closing the loop between deforestation and sheep/goat keeping, that has led to the evolution of characteristically open and frequently even barren landscapes.

At the site of Horum Höyük this overall tendency is supported by the increasing relative frequencies of gazelle, (presumably wild) equids and hare during the prehistoric periods represented at this site. The small medieval animal bone assemblage also fits within the diachronic trend of increasing sedentism accompanied by deforestation.

While animal bones from Horum Höyük do not dramatically illustrate this phenomenon in and of themselves, a few sites selected from the literature were used to provide a background against which results in this paper can be better understood. In addition to Chalcolithic, Uruk and Early Bronze/Middle Early Bronze Age (EBA/MEBA) data from Horum Höyük, coeval sites shown in Figure 6 include the following:

- JA = Jebel Aruda (Late Chalcolithic; Buitenhuis 1988)
- AR = Arjoun (Late Chalcolithic; Grigson 2000)
- EKC = El Kowm 2-Caracol (Uruk; Vila 1998)
- HK = Habuba Kabira (EBA, MBA; Driesch 1993)

Although this list of sites is somewhat arbitrary, my choices serve to accentuate actual differences between the various assemblages. As mentioned before, El Kowm 2-Caracol, which is included in this graph, is a somewhat special case, owing to its location far away from the Euphrates. Bronze Age features from Habuba Kabira, located along the river south of the present border between Turkey and Syria shows a comparable pattern of an absence of pig and sheep/goat massively dominating over cat-

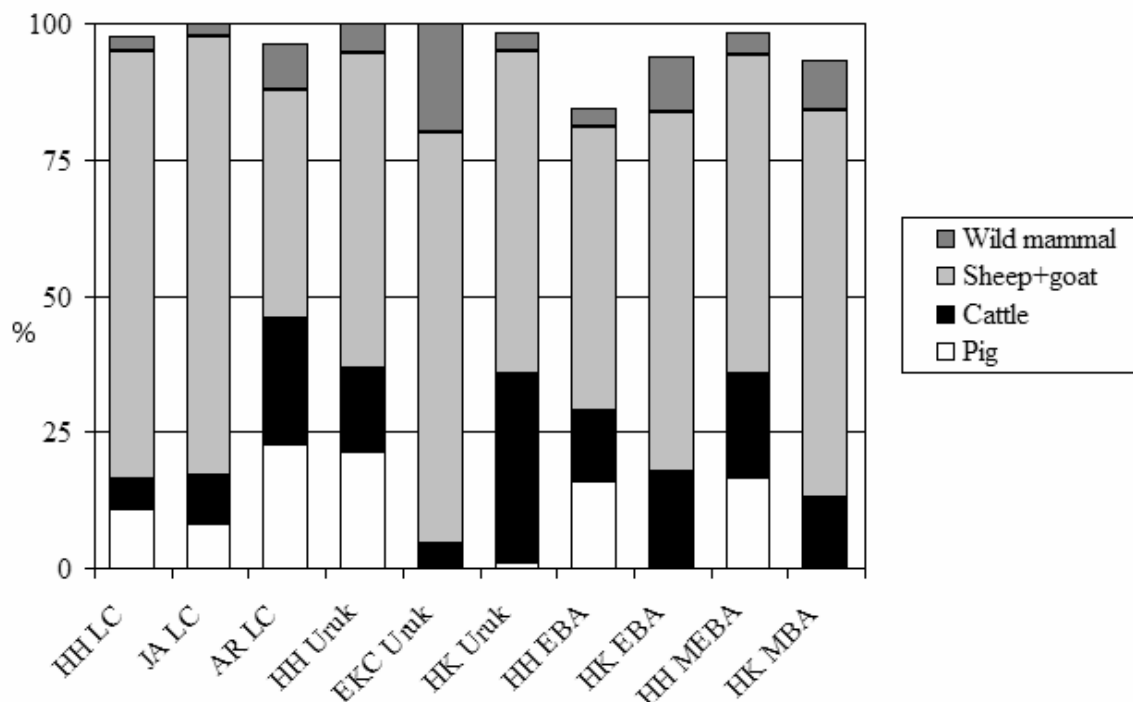


Fig. 6. The contribution of characteristic mammals (% of N) at Horum Höyük and other sites (explanation in text).

tle. These basic patterns are not much different from those observed in the Chalcolithic provenances of Horum Höyük and Jebel Aruda. Pig, however, was present at these latter sites (Fig. 6).

The presence of both wild and domestic pigs, and to some extent the evidence of limited hunting for red as well as fallow deer, raises the possibility that at the beginning, Horum Höyük corresponded to the definition of a modern 'forest village' (Izbirak 1976: 179), a small agricultural community subsisting in forest clearings, gradually expanding its fields and animal pasturage. This possibility is consistent with palynological data, indicative of the Chalcolithic and Early Bronze Age being the most forested periods in the region's Holocene history (Van Zeist and Bottema 1982). These observations are consonant with the hypothesis of the excavator, that the localized character of this Bronze Age cultural region seems to indicate that it somewhat stood apart from mainstream interregional connections. It may have been one of several self-contained units in the area, largely by-passed by the main trading routes (Catherine Marro personal communication).

The subsequent habitation layers of the settlement mound in the floodplain attained a respectable size and animal keeping became characterised by the overwhelming dominance of sheep and goat. At the time of excavation, the top of the tell rose some 35 m above the surrounding alluvial plain. In accordance with its optimal geographical position in the hill/mountain ecotone, and the tempering effect of the Mediterranean Sea on its climate, the rich mammalian fauna includes both the aforementioned forest animals and grassland (gazelle, wild ass, aurochs) species. It seems that pig consistently maintained its limited importance for a long time during the prehistory of this environment. Although hunting was not significant, when it was practised, hunters equally visited hilly areas to the north and plains to the south. The extent of fishing is difficult to assess in the absence of water-sieved samples from the site; a few vertebrae from large Cyprinids, including carp as well as crab remains, however, show that the river was also exploited for animal protein.

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