

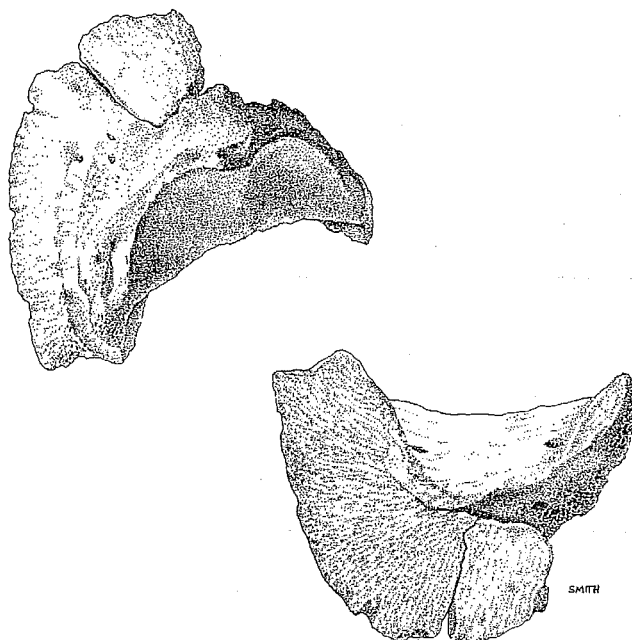


# ARCHAEOZOOLOGY OF THE NEAR EAST III

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

edited by

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



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Cover illustration: Dorsal and palmar aspects of a  
Bronze Age horse phalanx from Arslantepe, Turkey,  
identified by Sándor Bökönyi.  
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## Preface

This publication is the result of the third international symposium on archaeozoology of southwestern Asia and adjacent areas, held in Budapest, Hungary from 2 - 5 September 1996. The editors would like to thank all colleagues of the Working Group who helped with the translation of abstracts. Financial support for the publication was given by the Acker Stratingh Stichting, Groningen, The Netherlands.



Participants of the 3rd ASWA Conference, Budapest 1996  
(Photo: Péter Komjáthy, Aquincum Museum)

Standing, left to right: B. De Cupere (Belgium), G. Bar Oz (Israel), H. Buitenhuis (The Netherlands), R. Rabinovich (Israel), L. Leblanc (New Zealand), N. Benecke (Germany), H. Hongo (Japan), N. Russell (USA), J. Speth (USA), A. Patel (India), E. Stephan (Germany), C. Cavallo (The Netherlands), W. Van Neer (Belgium), A.T. Clason (The Netherlands), T. Dayan (Israel), L. Van Es (The Netherlands), C. Becker (Germany), R. Meadow (USA), M. Mashkour (France), F. Poplin (France), E. Vila (France), Mrs. Poplin (France), L. Bartosiewicz (Hungary), E. Pellé (France), P. Ducos (France).

In front, left to right: E. Tchernov (Israel), L. Martin (Great Britain), A. Choyke (Hungary), I. Zohar (Israel).

Participants not shown in picture: D. Carruthers (Great Britain), D. MacHugh (Ireland), S. Witcher (Great Britain).

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# PATTERNS IN ANIMAL FOOD RESOURCES IN THE BRONZE AGE IN THE ORIENT

Anneke T. Clason<sup>1</sup> and Hylke Buitenhuis<sup>1</sup>

## Resumé

Un essai est fait pour interpréter les changements généralisés dans la composition des faunes des sociétés urbaines du Bronze Ancien dans différentes régions en Orient, en terme de graduations en cours de développement de l'urbanisation et de l'organisation sociale avec une attention particulière sur la position différente des boeufs et des porcs dans les sociétés hautement organisées. L'introduction des animaux de bât se rapporte aussi au développement de sociétés complexes. L'occurrence d'animaux exotiques comme le castor, l'ours et l'éléphant éclaire l'aptitude d'organisation de ces sociétés, ce qui permet à ces animaux d'apparaître dans les régions discutées.

## Introduction<sup>2</sup>

In discussing the animal food resources in Bronze Age towns and other settlements it should be realized that the provisioning of towns comes from the countryside. The faunal remains from towns therefore reflect a composite of food resources which cannot be separated from each other. In our discussion we will focus on a more general picture of the exploitation of animal food resources in this period of emerging and developing towns, cities and states (Pfälzner, in press).

We cannot pretend to have included every published or unpublished report on faunal remains from Bronze Age towns in the Orient. But enough data has been gathered to establish a general pattern, and examine it relative to its relationship with developing cultural systems (Table 1).

A major problem, which also relates to earlier and later periods, is that only small parts of the towns and other sites in the Orient have been excavated. To our knowledge there is not a single site that has been completely excavated layer by layer. As a result, it is difficult to observe changes over a short time span within a site or chronologically between sites.

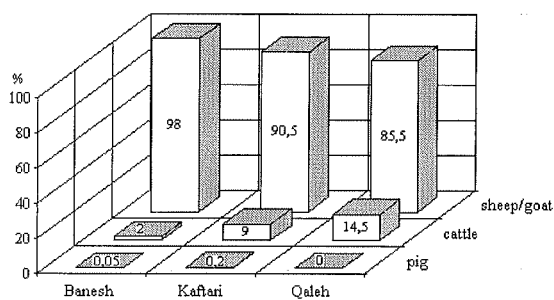


Figure 1. Percentages of the number of fragments in the layers of Tal-e malyan in Iran. (N=sum of sheep, goat and cattle).

Zeder (1991) has tried to work out faunal differences between various locations and layers at the urban site of Tal-e Malyan in the Khur river basin in southwestern Iran. With the proposed models however it was difficult to interpret the faunal remains collected during the excavation. Tal-e Malyan was probably not the right site for an experiment of this type, because in the Chalcolithic, Early Bronze Age and the Early Iron Age the majority of the bones belonged to sheep and goat, with low percentages of cattle and hardly any pig remains (Fig. 1). Remains of wild species were scarce, respectively 0.1, 0.3 and 0.6 % of the total of domestic and wild mammal bones in the different layers at tal-e Malyan.

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<sup>2</sup> This paper is a slightly modified version of a paper presented at the I. Internationales Colloquium der Deutschen Orient-Gesellschaft: Die Orientalische Stadt: Kontinuität - Wandel - Bruch. Halle, May 1995 (Clason and Buitenhuis, 1997).

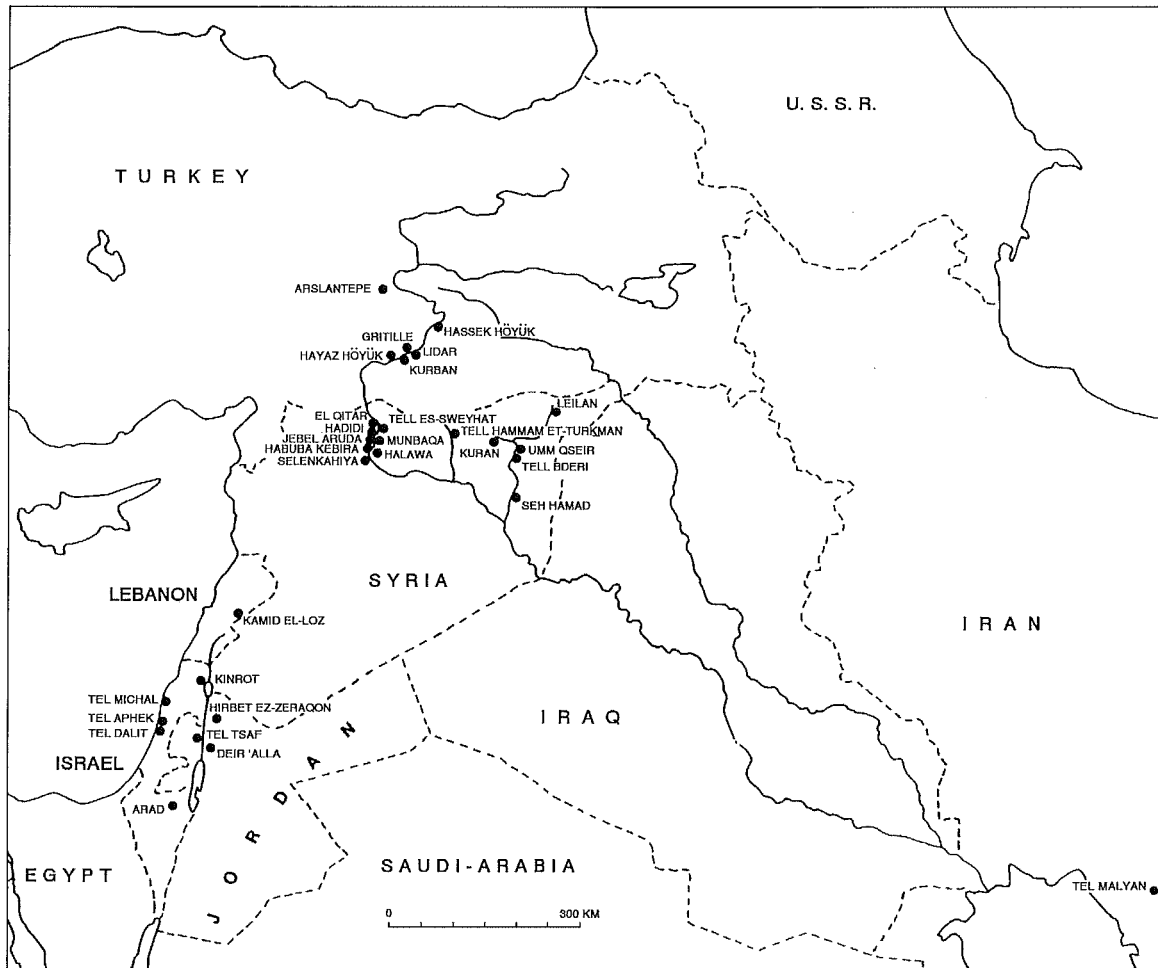


Figure 2. Geographical location of the sites mentioned in the text (see Table 1).

It is also difficult to gain insight into the animal food resources in the Orient from written sources, although these can give very useful information on details concerning the age and sex of animals. Zeder (1991) analysed the administration records of the central depot of Drehem for the acquisition and redistribution of cattle, sheep, goat, donkey and horse for the Sumerian Kingdom of Ur III, which flourished from 2150 to 1950 BC. These transactions were meticulously administrated. However, pigs were not included in the administration and wild species were only occasionally referred to. Thus, these records reflect only a specific part of the food provisioning.

Our data on the animal food resources of the Bronze Age towns in the Orient come from studying the animal remains from a number of sites and from reading bone reports (Table 1). We discuss percentages of domestic species based on the number of bones. We have disregarded the weight of bones which can give additional data about approximate meat weight, as these are given in only a few bone reports. Minimal Number of Individuals (MNI) as represented by these bones has also been excluded. The MNI has the disadvantage that no standard way exists to calculate it. Therefore MNI can not be used reliably in interlayer or intersite comparisons.

The overall picture obtained from the animal bones from 30 sites, or 37 layers or stratigraphic units, is that the Bronze Age towns had a diet based on the consumption of sheep, goat, cattle and pig. When considering the percentages we have to keep in mind that one cow, bull or steer provides approximately the same amount of meat as four or five sheep, goats, or pigs.

		period:	A	A/B	B	B/C	C	C/D	D	D/E
nr.	site	author(s)								
	Levant:									
1	Arad	Lernau, 1972			•					
2	Tel Tsaf	Hellwing, 1988/89	•							
3	Tel Dalit	Hellwing, 1988/89			•					
4	Tel Aphek	Hellwing and Gophna, 1984			•					
5	Tel Michal	Hellwing, 1989					•			
6	Kinrot	Hellwing, 1988/89			•				•	
7	Deir 'Alla	Clason and Buitenhuis, 1978								•
8	Hirbet ez-Zeraqon	Dechert, 1995		•						
9	Kamid el Loz	Bökönyi, 1990					•	•	•	
	North Syria:									
10	Selenkahiya	Ijzereef, manuscript			•					
11	Habuba Kebira	von den Driesch, 1993	•		•		•			
12	Jebel Aruda	Buitenhuis, 1988	•							
13	Halawa	Boessneck and von den Driesch, 1989			•		•			
14	Mumbaqa	Boessneck and von den Driesch, 1986/88			•				•	
15	Hadidi	Buitenhuis, 1979					•		•	
16	Tell es-Sweyhat	Buitenhuis, 1986			•					
17	El Qitar	Buitenhuis, 1988							•	
18	Tell Hammam et-Turkman	Buitenhuis, manuscript	•		•		•		•	
19	Seh Hamad	Becker, 1991							•	
20	Tell Bderi	Becker, 1988			•				•	
21	Umm Qseir	Zeder, 1994	•							
22	Kuran	Zeder, 1994	•							
23	Leilan	Zeder, 1994			•					
	Southeast Turkey:									
24	Kurban	Wattenmaker, 1987				•				
25	Hayaz Höyük	Buitenhuis, 1988	•	•	•					
26	Gritille	Stein, 1987			•					
27	Lidar	Kussinger, 1988			•		•		•	
28	Arslantepe	Bökönyi, 1982	•		•					
29	Hassek Höyük	Stahl, 1989	•		•					
	Iran:									
30	Tel Malyan	Zeder, 1991	•				•			•

Table 1. Sites from which faunal data was available in the different periods used in the analysis. For geographic location see Figure 2. Site numbers are referred to in figures 3-6.

- Period: A - Late Chalcolithic (> 3000 BC)  
 B - Early Bronze Age (3000 - 2000 BC)  
 C - Middle Bronze Age (2000 - 1500 BC)  
 D - Late Bronze Age (1500 - 1250 BC)  
 E - Early Iron Age (< 1250 BC)

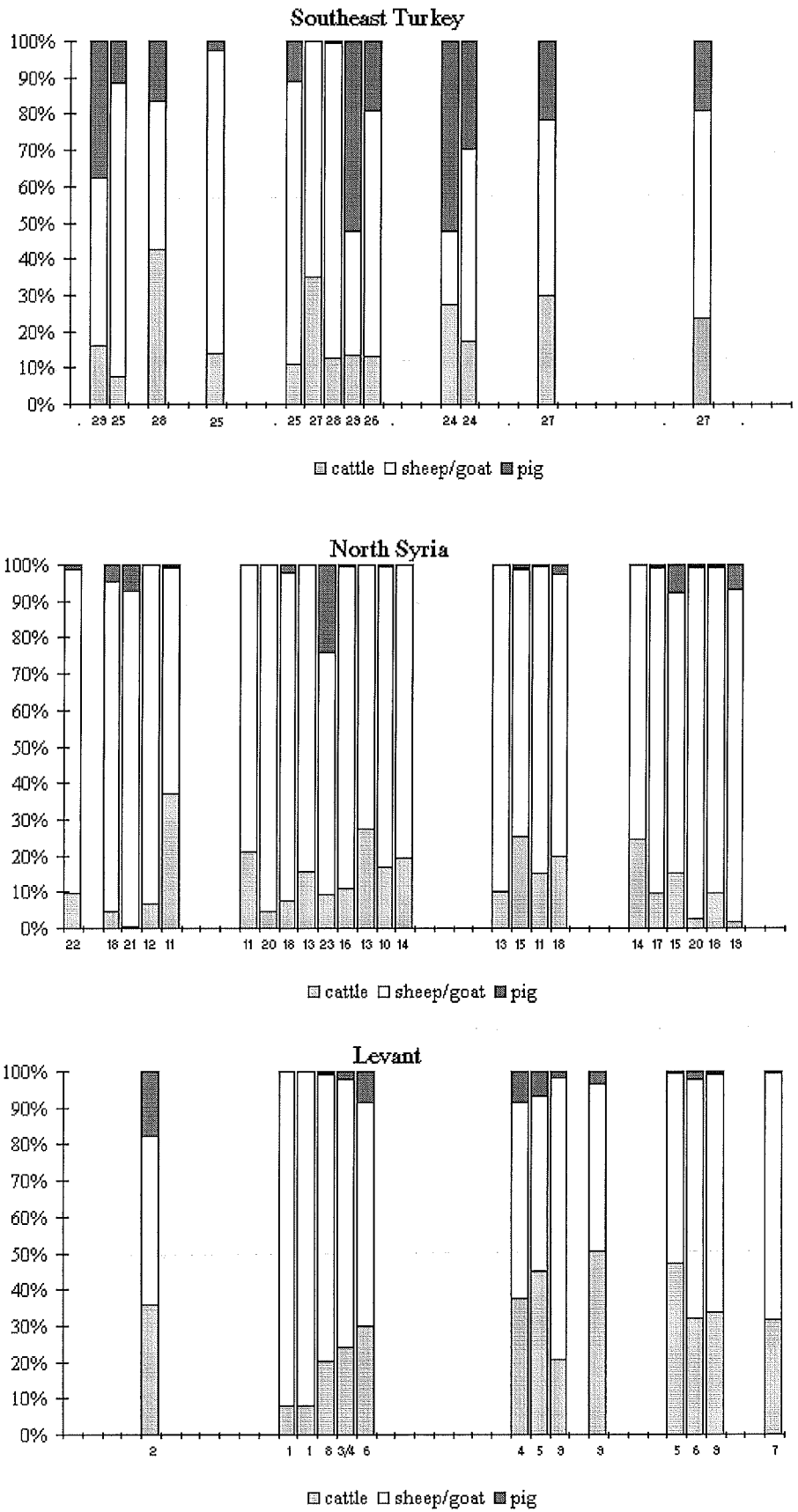


Figure 3. Relative proportions of sheep/goat, cattle and pig at the different sites from the different regions. Sites are arranged in an approximately chronological order (for sites numbers and periodisation see Table 1).



## **Sheep, goat, cattle, pig**

Although the diet is based on sheep, goat, cattle, pig, these species were not consumed in equal proportions in the three regions. In the Levant, sheep, goat and cattle are the most abundant food animals, although pig is always present (Fig. 3). In northern Syria, sheep and goat are the main food animals, with cattle in second place and pig only in very low percentages (Fig. 3). In southeastern Turkey sheep and goat are less dominant and pig is found in higher percentages (Fig. 3). In the Khur basin in Iran, sheep and goat were the principal food animals (Fig. 1). The percentages are based on the total number of remains of sheep, goat, cattle and pig. The proportions in which sheep, goat, cattle and pig are found show that the ratios are to a large extent dependent on the environment. In the north of Syria and in the southwest of Iran the climate is drier than in southeastern Turkey and the Levant, the Biblical 'land of milk and honey'. Milk and dairy products, although probably of some importance, are not considered in this paper.

Not only are there slight differences between the regions, but in each area we may also tentatively observe a similar trend of increasing importance of cattle in the Early Bronze Age, a stabilization in the Middle Bronze Age, and possibly a decrease in the Late Bronze Age. A model proposed by Zeder (1994), Hesse (1990) and others suggests that in these areas the utilization of cattle intensifies with an increase in wider regional organisation, such as the development of towns, cities and states. At the same time, the model states that pigs are used mainly locally and therefore increase in importance when the regional authority loses influence and local self-organisation becomes more prominent. The first part of this model seems to fit in the three regions, taking into account the local environmental restrictions. The second part of this model, relating to the role of pig, is much less clear and may therefore be more of a local phenomenon than part of a structural trend.

## **Hunting, introduction of new species and breeds**

Remains of wild mammals, birds, reptiles, amphibians, fishes and molluscs were encountered in many sites. These were generally found in small numbers and therefore are unlikely to have contributed much to the diet of the inhabitants of Bronze Age cities in the Orient. They might, however, have enlivened the cuisine now and then as luxury foodstuffs, or have provided other luxuries such as furs.

A problem with the interpretation of these remains is that while most archaeozoologists will identify wild mammal species only a few of our colleagues have identified remains of birds, fish and micro-fauna. For the identification of these groups we need good reference collections, which are often not available. For this overview we therefore counted only the numbers of recovered and identified wild mammal species. The largest number of wild mammal species was found in southeastern Turkey: thirteen. In both the Levant and northern Syria the numbers of wild species range from one to twelve (Fig. 4,5).

Interesting features in a bone assemblage are conspicuous game species, the introduction of new species or the introduction of new forms of domestic species, or a new way of using domestic species. In this period examples of such phenomena include the hunting of elephants, the introduction of domestic fowl, of zebu or humped cattle, and of donkey, horse and dromedary as pack-animals. These features will be discussed separately.

As already mentioned, hunting was economically of no importance in the Bronze Age towns and cities of the Orient, in contrast to the preceding period of the Chalcolithic, in which some sites show that hunting could be a major source of animal products (Zeder, in press). The record on wild species is very incomplete. Regularly hunted mammal species are: gazelle, onager, deer, hare and fox. Other species occur only sporadically. All hunted mammal species generally could have been found in the surroundings of the cities, except for the following three:

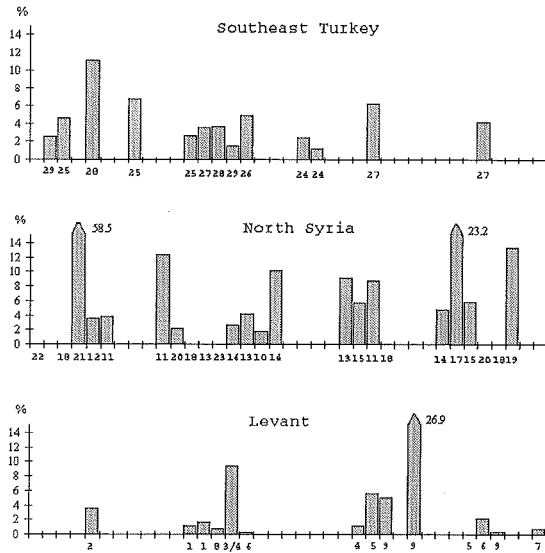


Figure 4. Percentages of the number of fragments of wild mammals at the various sites (N= number of fragments from domestic and wild mammals).

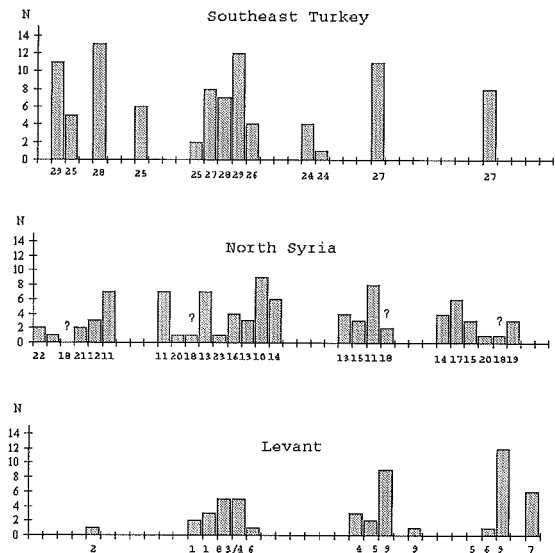


Figure 5. Number of wild mammal species at the various sites.

Beaver - *Castor fiber*. Beaver has only been found in northern Syria at the sites of Halawa, Hadidi and El Qitar. The few Bronze Age finds still suggest a fairly unspoilt and undisturbed, wet river-valley ecosystem.

Brown bear - *Ursus arctos*. The finds of brown bear in northern Syria, in Halawa and El Qitar are again somewhat surprising. The species did not occur in the lower foothills or steppe areas, but rather in the higher hills of the Taurus and Lebanon mountains. How these bear remains came to northern Syria is as yet unexplained.

Elephant - *Elephas* sp. Elephants are mentioned in texts in the tomb of Rekmere in Egypt and on the stèle of Thutmosis III (c. 1464 BC) as native to the Euphrates valley (Benecke, 1994). Becker (1994) mentions fifteen sites with elephant remains. The following are known from the sites under discussion. Fragments of elephant bones have come from the Late Bronze Age layers at Kamid el-Loz in the Levant (Bökönyi, 1990), from the Early and Late Bronze Age layers of Munbaqa (Boessneck and von den Driesch, 1986) and from the Late Bronze Age layers of El Qitar (Buitenhuis, 1988) in northern Syria. Bökönyi is of the opinion that the remains of Kamid el-Loz probably belonged to the African elephant, *Loxodonta africana*, because in the Bronze Age Kamid el-Loz was under heavy Egyptian influence. This might mean, that the bones belonged to an animal imported from Egypt, in which case the animal could have been domesticated or at least tamed. Buitenhuis (1988) however believes that the two fragments found at El Qitar belonged to the Indian elephant, *Elephas maximus*, since a femur fragment compared better with the femur of an Indian elephant in the collection of the National Natural History Museum in Leiden than with the femur of an African elephant. If the El Qitar animal(s) were hunted, as suggested by Buitenhuis (1988), and is mentioned on the stèle of Tutmosis III, this raises important questions as to where these animals came from, where in this region they lived, and why no pictorial evidence of elephants is known. Considering the many figurines, statuettes and pictures of all kinds of animal, it is hardly imaginable that elephants had somehow been overlooked. If, however, these animals did not occur naturally, but were imported from the Indian subcontinent, one wonders what kind of system allowed these huge grazers into the apparently densely populated area of northern Syria.

A new species, coming from the Indian subcontinent or western China, was the domestic fowl, *Gallus gallus domesticus* (West and Zhou, 1988). Only a few remains have appeared in the Levant, from

the Late Bronze Age layers of Kamid el-Loz and the Late Bronze/Early Iron Age layers of Deir'Alla. In northern Syria the domestic fowl is known from the Early Bronze Age of Sweyhat and the Middle Bronze Age of Hadidi. In southeastern Turkey the domestic fowl was found in the Early Bronze Age layers of Lidar. Although the remains are scant, they do indicate that the domestic fowl was present. A silver plate is known from the Late Bronze Age (1305 - 1196 BC) site of Tell Basta in Jordan. It has an image of two hens and a cock on it. In Egypt a piece of limestone with a painting of a cockerel was found, which also is dated to the Late Bronze Age (1425-1123 BC; Benecke, 1994). These pictures corroborate the bone evidence. Domestic fowl could have contributed poultry and eggs.

The oldest known finds of humped or zebu cattle come from Mehrgahr in western Pakistan and are dated to c. 6000 BC (Meadow, 1984). Zebu cattle came to Mesopotamia and the Levant in the Late Bronze/Early Iron Age from this area. Bones as well as images and figurines have been found. One bifurcate vertebra, typically for zebu, was found in the Late Bronze Age of Deir'Alla in the Jordan Valley and two more came from the Early Iron Age layers of the same tell (Clason, 1978). Although the zebu did reach the Orient, it probably never became prominent as a meat provider. However, the bones, pictures and figurines point to trade with southern Asia, where the zebu still is common nowadays.

Remains of the Arabian camel or dromedary, *Camelus dromedarius*, are known from Upper Pleistocene layers in the Levant and the Near East (Clutton-Brock, 1970). Clutton-Brock considers the remains found in those layers at Azraq probably to be most likely from wild animals. The dromedary might have been domesticated in southeastern Arabia (Benecke, 1944; Uerpmann, pers. comm.), but little is known about the domestication of this species and its subsequent spread. Hakker-Orion (1984) believes that bones found at Early Bronze Age Arad and Be-er Resisim in the Negev might still have come from wild animals. It is certain, that dromedary bones are found in small numbers in a few Late Bronze Age sites.

Dromedary remains become common only in the Early Iron Age and subsequent periods. For instance, in Tell Jemmeh, 10 km south of Gaza, Wapnish (1984) found five bones from the Late Bronze Age, two from the 11-10th century BC, eight from the period 800-700 BC and 40 bones from the period 675-600 BC, 188 from the period 600-332 BC and 85 from the period 332-200 BC. Dromedary bones were found in the Late Bronze Age/Early Iron Age layers of Deir'Alla in the Levant, in the Late Bronze Age layers of Lidar in southeastern Turkey, and the Late Bronze Age of Hadidi in northern Syria. At Tal-e Malyan in southwestern Iran the first dromedary bones date to the Early Iron Age. The earliest find of dromedary in the Sudan dates from the first millennium BC (Rowley-Conwy, 1988). This is in accordance with Hakker-Orion (1984) who states that in the beginning of the Early Iron Age, dromedary took its place alongside the donkey, sheep and goat as a prominent element of the economy of Israel. The same applies to other areas in the Orient. The dromedary was primarily a pack-animal.

During the Bronze Age and certainly in the Iron Age, the donkey, horse, mule and dromedary became important pack-animals used for transport (Fig. 6). Without pack-animals, large-scale trade and pastoral nomadism would have been unthinkable. Khazanov (1993) defines pastoral nomadism from the economic point of view as: "a distinct

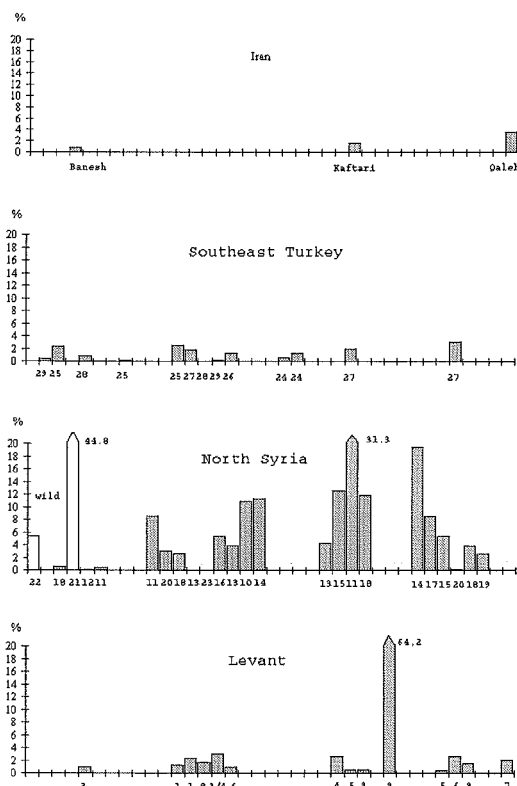


Figure 6. Percentages of the number of fragments of equids in the different sites. (N= total of sheep/goat, cattle, pig and equids).

*form of food-producing economy in which extensive mobile pastoralism is the predominant activity and in which the majority of the population is drawn into periodic pastoral migration*" (Khazanov, 1993: 17). and "*Pastoral nomadism proper is characterised by the absence of agriculture*" (Khazanov, 1993: 19). In the Orient this situation did not exist and there was a variety of sedentary urban, sedentary rural, agro-pastoralist and pastoralist systems that engaged occasionally in agricultural activities (Finkelstein, 1992: 134). Mobile pastoralism is possible only if pack-animals are available. With dromedaries as pack-animals it became possible to cross deserts and to follow shorter routes than had been possible without the use of dromedary. The same applies to large-scale and long-distance trade.

## Discussion and conclusions

We have given a short overview of changes and continuity in the animal food resources in Bronze Age towns of the Orient and of the use of some species other than as food animals. The picture of an exploitation of the environment almost exclusively based on sheep, goat and cattle seems to undergo a slight change in the Late Bronze Age. In general, the archaeological indications are of a slackening of the larger regional organisations as Zeder (1991) and Hesse (1990) argue. In the archaeozoological record we may observe the following:

1. A slight decrease of the prominence of cattle in several regions and consequently an equal increase of the importance of sheep and goat.
2. A slight increase in the importance of pig, although not as a consistent pattern,
3. The occasional appearance of new species such as dromedary and domestic fowl, and of new forms such as zebu cattle.
4. The possible hunting of elephants in northern Syria, which at least in the Late Bronze Age was densely populated by man.

In general, we may conclude that with the evolution of larger social structures such as towns, cities and states, the dependence on sheep, goat and cattle became even more dominant than in the Late Chalcolithic. At a few sites pig may have played a significant role. Since much of the three major regions is arid, it is natural that sheep and goat remains are the most numerous. An increase in cattle may therefore suggest either an environmental change, for which there is no particular evidence, or a change in the organisation of the use of richer pastures. The latter is more easily organized from a higher social level and may point to a society of increased complexity.

The presence of equids: mainly donkeys and mules, much less of horse, also suggests exchange between different localities, which can only have been profitable if organized on a higher than local level.

On the other hand, the changes in the Late Bronze Age and subsequently in the Early Iron Age suggest a slight change of this complex society. The decreasing importance of cattle in northern Syria, the increase of sheep and goat and locally of pig, may suggest a more locally organized society. In northern Syria the occurrence of fewer equids suggests a decrease in trade-exchange between regions (Fig. 6).

The occurrence of exotic animals such as beaver, bear and elephant suggests a lessening of the highly integrated, intensive farming of the Early and Middle Bronze Age. And finally the appearance and subsequent growth in prominence of dromedaries in the Early Iron Age (Hakker-Orion, 1984) suggests even further change, which could have led to a nomadic pastoralism, existing side by side and in interconnection with urban sites. This might explain why for instance in northern Syria so few sites from the Early Iron Age have been found (Van Loon, 1967).

We have barely touched on stockfarming activities not involving slaughter, such as milking and wool-shearing. From pictorial and written evidence it is known that, for instance sheep underwent important physical changes, probably through selective breeding for specific characteristics. Examples are fine, full fleeces and fattailed sheep which occur in the Early Bronze Age. But before we can study these changes in the skeletal material, much more basic archaeozoological research needs to be done. Future research should concentrate on the evolution of breeds, which may give us a much better insight into the use of domestic animals other than as living larders.

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