

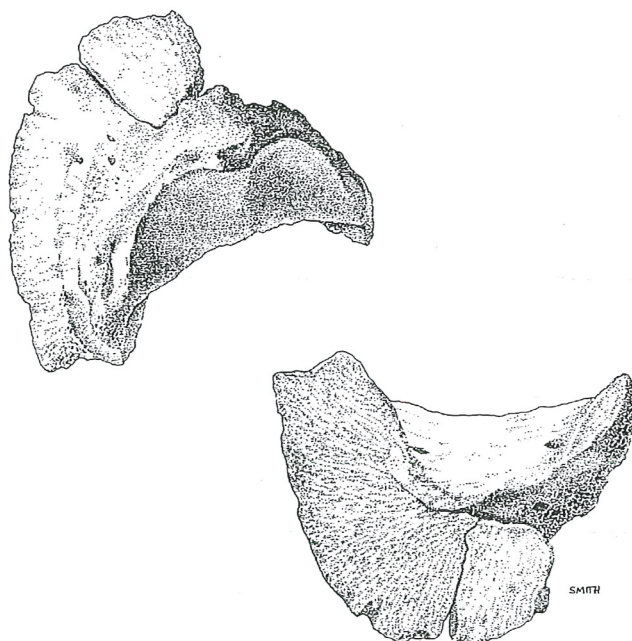


ARCHAEOZOOLOGY OF THE NEAR EAST III

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



ARC - Publicaties 18
Groningen, The Netherlands, 1998

Cover illustration: Dorsal and palmar aspects of a
Bronze Age horse phalanx from Arslantepe, Turkey,
identified by Sándor Bökönyi.
Courtesy by the artist, Patricia Smith (Reduction: 64%).

Copyright:
Centre for Archeological Research
and Consultancy, Rijksuniversiteit Groningen The Netherlands

Printing: RCG -Groningen

Parts of this publication can be used if source is clearly stated.
Information: Centre for Archeological Research and Consultancy
Poststraat 6, 9712 ER Groningen, The Netherlands

ISBN 903670791-9
NUGI 644/821/835

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. Whitcher (Great Britain).

Contents

Preface

E.Tchernov	7
An attempt to synchronise the faunal changes with the radiometric dates and cultural chronology in Southwest Asia	
R. Rabinovich	45
“Drowning in numbers” - gazelles dominance and body size groups in the archaeozoological record	
G. Bar Oz, T. Dayan and D. Kaufman	72
Taphonomic analysis of the faunal remains from Neve David	
L. Kolska-Horwitz and P. Ducos	80
An investigation into the origins of domestic sheep in the southern Levant	
S. Bökönyi	95
Animal husbandry, hunting and fishing in the Ras Al-Junayz area: a basis for human subsistence	
S. Witcher, C. Grigson and Th.E. Levy	103
Recent faunal analyses at Shiqmim, Israel: a preliminary analysis of the 1993 assemblage	
L.J.M. van Es	117
A weasel femur (<i>Mustela nivalis</i> Linne 1766) from the Iron Age of Tell Deir 'Alla (Jordan)	
E. Vila	120
Interpreting the faunal remains of El Kowm 2 - Caracol (IVth millennium BC, Syria)	
M. Al-Zawahra and A. Ezzughayyar	130
Equid remains from Bronze Age periods of site 4 of Tell Jenin, Palestine	
D. MacHugh, R.T. Loftus, C.S. Troy and D.G. Bradley	135
DNA and the origin of domestic cattle	
N. Russell	145
The Mesolithic-Neolithic transition in the faunal assemblage from Konispol Cave, Albania	
L. LeBlanc	160
The accumulation and significance of micromammals in an Albanian cave site	
C. Becker	166
New data on the distribution of fallow deer in Europe during the Late Pleistocene and Holocene	
N. Benecke	172
Animal remains from the Neolithic and Bronze Age settlements at Kirklareli (Turkish Thracia)	
R. Meadow and A. Patel	180
The exploitation of wild and domestic waterbuffalo in prehistoric northwestern South Asia	
M. Mashkour	200
The subsistence economy in the rural community of Geoktchik Depe in Southern Turkmenistan: Preliminary results of the faunal analysis	
L. Bartosiewicz	221
Interim report on the Bronze Age animal bones from Arslantepe (Malatya, Anatolia)	
A.T. Clason and H. Buitenhuis	233
Patterns in animal food resources in the Bronze Age in the Orient	
W. Van Neer and M. Uerpmann	243
Fish remains from the new excavations at Troy	
H. Hongo	255
Patterns of animal husbandry in Central Anatolia in the second and first millennium BC: faunal remains from Kaman-Kalehöyük, Turkey	
B. De Cupere and M. Waelkens	276
The antique site of Sagalassos (Turkey): faunal results from the 1990 - 1994 excavation seasons	
B. De Cupere, W. Van Neer and M. Waelkens	285
Modern and ancient Ovicaprine herding in the Sagalassos area (Burdur Province, Turkey)	

EQUID REMAINS FROM THE BRONZE AGE PERIODS AT SITE 4 OF TELL JENIN (PALESTINE)

Muhammad Al-Zawahra¹ and Ademar Ezzughayyar²

Résumé

L'identification d'espèces d'*Equus* à Tell Jenin est basé au dessin d'émail des dents et sur les proportions d'os postcranial. Deux squelettes d'Age Bronze (Stratum III) ce sont trouvé. Les mesures indique que le plus grande d'individues est peut-etre un cheval propre. The plus petit individu (un individu d'age d'onze ans) es trouvé ave sa tete au corps, et est identifié comme une ane. Le plupart d'ossements sont articulé et il n'y a pas des traces de travail sur les os. Le conclusion est que les animaux sont utilisé pour le transport de l'homme et ses affaires, specialement l'ane qui est tres bien adapté au climate sec t chaud..

Introduction

The site of Tell Jenin (UTM 1785-2075) is located about 40 km east of the Mediterranean coast and 100 km north of Jerusalem. This site is found at an altitude of 150 m and its mean annual precipitation is 500 mm, with an average temperature of 20°C (10°C in January and 30°C in August). The Jenin region has a distinctive geomorphologic structure. It lies on top of the Nablus syncline within a number of Eocene calcareous deposits in which erosion basins have been formed, according to reports from field inspectors of the Department of Antiquities during the British Mandate. Tell Jenin was first identified by Albright (1926) as the site of an ancient town on top of which was a modern cemetery and a threshing floor. The Tell is also known as Tell el-Nawar (Arabic word for gypsies), because of annual nomadic encampments on the mound prior to 1948. Precise stratigraphic study of the archaeological history of the site and the region of Jenin began in 1977 with Birzeit University salvage excavations at four sites on the Tell (Glock, 1979; 1987; Ezzughayyar *et al.*, 1996). Recent excavations and surveys of site 4 (1980-1983) indicate that the most ancient occupation of the Tell dates to the late Neolithic - early Chalcolithic period.

This study will cover the presence of equid remains from burials from the Early Bronze Age period, as well as their probable exploitation and symbolic importance for the inhabitants of Tell Jenin.

Materials and Methods

All the studied material was recovered by hand during the excavation of the tell. The material was identified and analysed at the Palestinian Institute of Archaeology at the Birzeit University by the authors. Complete bones were measured according to Von den Driesch (1976). We used data from dental analyses following Payne (1973) and fusion stages according to Silver (1969), to determine the age of the animals. Both the total number of identified fragments, and the minimum number of individuals (Chaplain, 1974), were used to quantify the economic importance of the species.

The identification of different *Equus* species at Tell Jenin is based on the enamel patterns of the cheek teeth and the size and proportions of the limb bones.

¹ Palestinian Institute of Archaeology, Birzeit University, P.O.Box 14, Birzeit, West Bank-Palestine.

² Department of Biology and Biochemistry, Birzeit University, P.O.Box 14, Birzeit, West Bank-Palestine.

Results

As table (1) shows, the equid remains found at site 4 of Tell Jenin include 10 fragments in addition to the two articulated skeletons. These remains constitute 0.4% of the total faunal remains from the site. Nine fragments were found in Strata IV and V, and the other fragment is a right upper third molar from Stratum VI. All of the long bones are fused: one proximal left femur, two distal right humerus, one distal metatarsal III, one proximal right metatarsal II, one distal left metapodial. The teeth consist of one lower left premolar II, one right upper cheek tooth, and one upper cheek tooth. Two equid skeletons were found in the Early Bronze Age period (Stratum III). An incomplete skeleton of a large *Equus* was either from a horse or a large donkey. Its age at the time of death was calculated by using epiphyseal closure and it was found to be 3-3.5 years following Silver (1969).

Identified Fragments	Strata						Total
	I	II	III	IV	V	VI	
Equid	-	-	-	3	5	-	8
<i>Equus asinus</i>	-	-	1*	-	-	-	1
<i>Equus caballus</i>	-	-	1*	1	-	1	3

Table 1. Distribution of Equid remains per stratum of site 4 at Tell Jenin. (Strata are : I= natural sediment; II= Pre-Pottery Neolithic; III= Early Bronze Age I (c. 3200 BC); IV= 13-12th century BC; V and VI= Early and Late Byzantine period (324-640 AD).

Measurements of a large Equid													
Atlas		BFcd	81.7										
Axis		BFcr	82.0	SBV	44.1								
Scapula	R	SLC	49.0	GLP	89.0	LG	55.5	BG	43.5	SGW	28.1	SGH	37.8
Humerus	R	GLl	275.1	GLc	265.0	Bp	84.2	Dp	94.1	SD	31.1	Bd	76.5
		BT	71.0	Dd	74.0								
Radius	R	GL	320.0	GLl	305.0	Bp	84.2	BFp	71.1	SD	35.8	Bd	73.0
		BFd	61.2	Dd	42.0								
Metacarpus	R	GL	217.5	LI	209.0	GLl	214.0	Bp	47.6	Dp	32.5	SD	31,5
		Bd	47.3	Dd	35.0								
Femur	R	SD	36.7	Bd	87.5								
Tibia	R	GL	338.5	GLl	308.0	Bp	91.0	SD	37.5	Bd	71.0	Dd	43.9
Talus	L	GH	55.5	LmT	56.5	GB	60.0	BFd	49.7				
Calcaneus	R	GL	258.5	GB	288.5	DW	49.0						
Metatarsus	L	GL	258.5	LI	250.0	GLl	253.5	Bp	49.0	Dp	43.0	SD	29,5
		Bd	47.0	Dd	36.5								
Phalanx I anterior		GL	81.5	Bp	52.5	BFp	47.2	Dp	35.0	SD	33.2	Bd	43.5
		BFd	41.9										
Phalanx I posterior		GL	77.5	BFp	52.4	Dp	47.1	SD	34.5	Bd	31.8	DFd	42.5
Phalanx II anterior		GL	45.0	Bp	49.5	BFp	44.7	Dp	35.0	SD	43.5	Bd	47.5
		BFd	46.6	Dd	24.5								
Phalanx III		GL	55.0	GB	72.0	BF	42.6	LF	26.7	Ld	47.8	Hp	35.0

Table 2. Measurements (mm) obtained from some bones of a large equid from Tell Jenin. (measurements and abbreviations according to von den Driesch, 1976).

The measurements of the long bones, listed in Table 2, indicate that this skeleton may belong to horse, *Equus caballus*. Relevant indices (Metacarpus/Radius length= 67.9%; Metacarpus slenderness index $cq. SD/GL = 14.3\%$; Robustness index of proximal anterior phalanx= 40.74%; Robustness index of proximal posterior phalanx= 41.03%; Radius= 11.2%; Tibia= 11.1% and Metatarsus= 11.4%) indicate that our identification may be correct. Table 3 shows the measurements of the lower left teeth which coincide with the characteristics and measurements of horse teeth.

Teeth	occlusal length	occlusal width	height crown	length postflexid	length pre-flexis
dp2	30.1	13.8	13.9	15.6	13.0
dp3	26.7	14.0	16.6		
dp4	29.0	13.3	14.6		
M1	30.0	11.5	73.3		
M2	27.2	9.5	biting surface with cement		
M3	just erupted				

Table 3. Measurements (mm) of lower left teeth of *Equus caballus* from site 4 of Tell Jenin.

The small equid remains were lying on a surface covered with sherds. The animal was found lying on its left side, with the neck bent back to the right and the head lying in the middle of the rib cage, suggesting that it was interred in this position. This organised position suggests also, that it might have been buried in this pit and not just thrown in. It is a male as may be seen from the presence of four developed canines. The age could be estimated as eleven years, following Silver (1969), using the dental data (Table 4).

Teeth	occlusal length	occlusal width	height crown	length protocone
P1	5.8	5.3	6.7	
P2		20.6		6.3
P3	26.1	22.5		10.9
P4	23.0	22.8		11.7
M1	21.3	23.5		10.0
M2	20.7	22.5		10.2
M3	21.7	20.4		9.6

Table 4. Measurements (mm) of the upper right teeth of the donkey from site 4 of Tell Jenin.

Discussion

The faunal remains from site 4 at Tell Jenin indicate a nearly complete dependence on domestic mammals. Both *Equus caballus* and *Equus asinus* were used at ancient Tell Jenin. Most of their bones are articulated, and no cut marks could be detected on any of them. Thus these animals were used for transport of man and his goods, especially donkeys which can live in dry and hot environments.

Donkeys were used in small numbers at all the Early Bronze Age sites studied and appear to have served as pack animals during both the Chalcolithic and Early Bronze Age (Horwitz, 1989). Figurines of donkeys/asses are known from the Early Bronze Age at Jericho and Ras El-Ain (Grigson, 1987; Epstein, 1985). Domestic ass, *Equus asinus*, was reported at Tell Sweyhat in the Early Bronze Age (Buitenhuis, 1989).

The identification of the skeletons of both equids at Tell Jenin was based on the enamel patterns of the cheek teeth and the size and proportions of the limb bones. Data in Table 4 explain the characters which distinguish the upper teeth of the donkey, *Equus asinus*, from those of the horse, *Equus caballus*.

Those characters for *E. asinus* are the flat interstyler faces, narrow mesostyle and short protocone. In the lower teeth, the linguaflexid is strongly v-shaped, the ectaflexid is shallow, and the postflexid is long.

The proportions of limb bones show that the length of metacarpal is less than 70% of the radius length. In our donkey (Table 5) it was 65.7% (Metacarpus length/Radius length: 16.75/25.5 x 100% = 65.7%). Another distinction between asses and other equids is the ratio of the midshaft width to metacarpal length which in asses is over 12.4% (Clutton-Brock, 1986). The Tell Jenin small *Equus* has a slenderness index of 12.8% (Metacarpus SD/GL= 21.5/167.5 x 100= 12.8%). Besides that the shoulder height is about 105 cm, which matches the size of donkeys. From all of these indications our *Equus* could be identified as *Equus asinus*.

The data in both Tables 2 and 3 support our identification of the large equid as *Equus caballus*. The following indices are within the horse range: metacarpal slenderness index = 14.3%; index of robustness of proximal anterior phalanx = 40.74%; index of robustness posterior phalanx = 41.03%. Moreover, the shoulder height was about 135.1 cm (Metatarsus GL= 258.5). So it is more likely that the large equid of Tell Jenin is that of an *Equus caballus* stallion.

A wider discussion of the significance of horse burials is beyond the scope of this paper. We could not demonstrate that horses were favoured above other animals, or whether the practice of burying horses alongside people had a particular ritual significance. Another idea might be raised concerning the sexual dimorphism of the horse, which means that its sex mattered more than its age. But since the number of *Equus* remains is limited, we could not develop the idea in that direction.

Measurements of <i>Equus asinus</i>													
Humerus	R	Bp	64.0	Dp	70.6	SD	23.9	Bd	56.0	BT	52.5	Dd	70.6
Radius	L	GL	254.5	LI	244.0	Bp	58.0	BFp	52.8	SD	27.1	Bd	60.0
		BFd	46.1	Dd	31.0								
Metacarpus	R	GL	166.0	LI	160.0	GLI	162.0	Bp	36.0	Dp	25.0	SD	21.5
		Bd	33.5	Dd	25.5								
Femur	L	GL	282.0	GLc	260.0	SD	26.0						
Tibia	R	GL	268.0	LI	247.0	Bp	70.0	SD	31.5	Bd	55.0	Dd	35.0
Talus	L	GH	44.5	LmT	42.0	GB	45.0	BFd	35.1				
Calcaneus		GL	81.3	GB	37.0								
Phalanx I anterior		GL	65.2	Bp	35.1	BFp	34.0	Dp	26.2	SD	21.8	Bd	31.0
		BFd	31.8	Dd	20.0								

Table 5. Measurements (mm) of the limb bones of the donkey from site 4 of Tell Jenin. (Measurements and abbreviations according to Von den Driesch, 1976).

Acknowledgements

We are very grateful to Dr. Khaled Nashef, the director of the Palestinian Institute of Archaeology, for making the faunal material of Tell Jenin available. We thank also Mrs. Lois Glock for her technical and editorial assistance.

References

- Albright, W.F. 1926. The topography of the tribe of Issachar. *Zeitschrift für die Alttestamentliche Wissenschaft* 44: 225-236.
- Buitenhuis, H. 1989. The animal remains of Tell Sweyhat. *Palaeohistoria* 25: 132-143.

- Chaplin, R.E. 1974. *The study of animal bones from archaeological sites*. London and New York, Seminar Press
- Clutton-Brock, J. 1986. Osteology of the equids from Sumer. In: R.H. Meadow & H-P. Uerpmann (eds.), *Equids in the Ancient World*. Beihefte zum Tübinger Atlas des Vorderen Orients. A. 19/2, Wiesbaden: 207-229
- Epstein, C. 1985. Laden animal figurines from the Chalcolithic Period in Palestine. *Bulletin of the American Schools of Oriental Research* 258: 53-62.
- Ezzughayyar, A., M. Al-Zawahra and H. Salem, 1996. Molluscan fauna from site 4 of Tell Jenin Northern West Bank-Palestine. *Journal of Archaeological Science* 23: 1-6.
- Glock, A.E. 1979. Tell Jenin. *Revue Biblique* 86: 110-112.
- Glock, A.E. 1987. Tell Jenin excavations, 1977-1983. *Birzeit Research Review* 4: 4-30.
- Grigson, C. 1987. Pastoralism, pig-keeping and other aspects of the Chalcolithic in the Northern Negev. In: T.E. Levy (ed.), *Shiqmim I*. BAR International Series 356. Oxford: 219-241.
- Horwitz, L.K. 1989. *Animal exploitation in the Early Bronze Age of the Southern Levant*. BAR International Series 527(ii).
- Payne, S. 1973. Kill-off patterns in sheep and goats: The mandibles from Ašvan Kale. *Anatolian Studies* 23: 281-303.
- Silver, I.A. 1969. The ageing of domestic animals. In: D.R. Brothwell and E.S. Higgs (eds.), *Science in Archaeology*. 2nd ed. London, Thames & Hudson: 283-302.
- Von den Driesch, A. 1976. *A guide to the measurement of animal bones from archaeological sites*. Peabody Museum Bulletin 1, Harvard, Harvard University Press.