

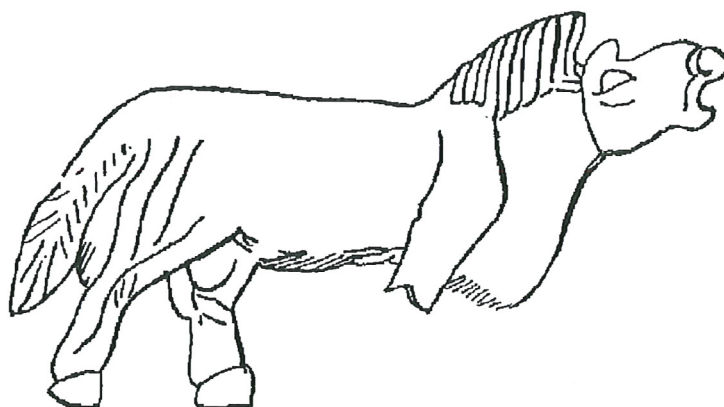


# ARCHAEOZOOLOGY OF THE NEAR EAST IV A

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

edited by

**M. Mashkour, A.M. Choyke, H. Buitenhuis and F. Poplin**



**ARC - Publicatie 32**  
**Groningen, The Netherlands, 2000**

Cover illustration:

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Centre for Archeological Research and Consultancy

Groningen Institute for Archaeology

Rijksuniversiteit Groningen The Netherlands

Printing: RCG -Groningen

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Information: Centre for Archeological Research and Consultancy

Poststraat 6, 9712 ER Groningen, The Netherlands

ISBN 90 – 367 – 1243 - 2

NUGI 644 - 134

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# ANALYSIS OF THE CATTLE BONES OF THE PREPOTTERY NEOLITHIC SETTLEMENT OF ÇAYÖNÜ

Banu Öksüz<sup>1</sup>

## Abstract

The results of an analysis of cattle (*Bos sp.*) bones from the first four Prepottery Neolithic levels at Çayönü--Round Building, Grill Building, Channeled Building, Cobble-paved subphases- are presented in this paper. Body size and kill-off patterns of cattle at Çayönü were analyzed in order to investigate the exploitation patterns of cattle at the site. Cattle was abundant at Çayönü during the Prepottery Neolithic after pigs, sheep and goats. The ratio of cattle relative to red deer, however, decreases in the later two subphases analyzed -Channeled and Cobble-paved subphases. Butchering marks have been observed only on 5.5% of the material. Although there is no clear indication of cattle domestication, earlier kill-off and the presence of a few small specimens in later subphases suggest changes in the patterns of cattle exploitation at the site.

## Resumé

Les résultats d'analyse des ossements de bœuf (*Bos sp.*) appartenant aux quatre sous-phases du Néolithique précéramique (PPN) - le bâtiment en ronds, le bâtiment en grille, le bâtiment aux canalisations, le bâtiment pavé aux galets - de Çayönü Tepesi sont présentés dans ce travail. La taille et les âges d'abattage ont été estimés afin de mettre en évidence le mode d'exploitation de cet animal. Le bœuf était abondant à Çayönü durant le PPN après le porc, le mouton et la chèvre. Cependant le pourcentage du bœuf par rapport au cerf décroît dans les deux dernières sous-phases - le bâtiment aux canalisations, le bâtiment pavé aux galets -. Des traces de boucherie ont été observées seulement sur 5.5% du matériel. Bien qu'il n'y ait pas de preuve directe de domestication du bœuf, un abattage plus récent et la présence de quelques individus de petite taille dans les sous-phases les plus récentes suggèrent un changement dans l'exploitation du bœuf dans le site.

**Key words:** Cattle (*Bos sp.*), Çayönü, Prepottery Neolithic, Turkey, Kill-off Pattern, Size

**Mots Clés:** Boeuf (*Bos sp.*), Çayönü, Néolithique Pré-Poterie, Sud-Est de la Turquie, Ages d'abattage

## Introduction

The prehistoric site of Çayönü, located in southeastern Turkey, is one of the principal sites of the Neolithic period: occupation at the site covers almost the entire span of the Neolithic period from late PPNA up to the Pottery Neolithic. It has been extensively excavated, and the architecture is well preserved (Özdoğan, 1995). Thus, the material from the site is apt to give not only substantial but dependable information on different aspects of neolithization. Even though there has been some earlier work on the faunal material of Çayönü, these studies did not cover the material from the later seasons, and the stratigraphic sequence of the site was not known. The results of an analysis of cattle (*Bos sp.*) bones from the first four subphases at Çayönü, Round Building, Grill Building, Channeled Building, Cobble-paved Building subphases, are presented in this paper. Body size and kill-off patterns of cattle at Çayönü were analyzed in order to investigate the exploitation patterns of cattle at the site. One of the most important questions addressed in this study is whether there is any evidence for domestic cattle at the site.

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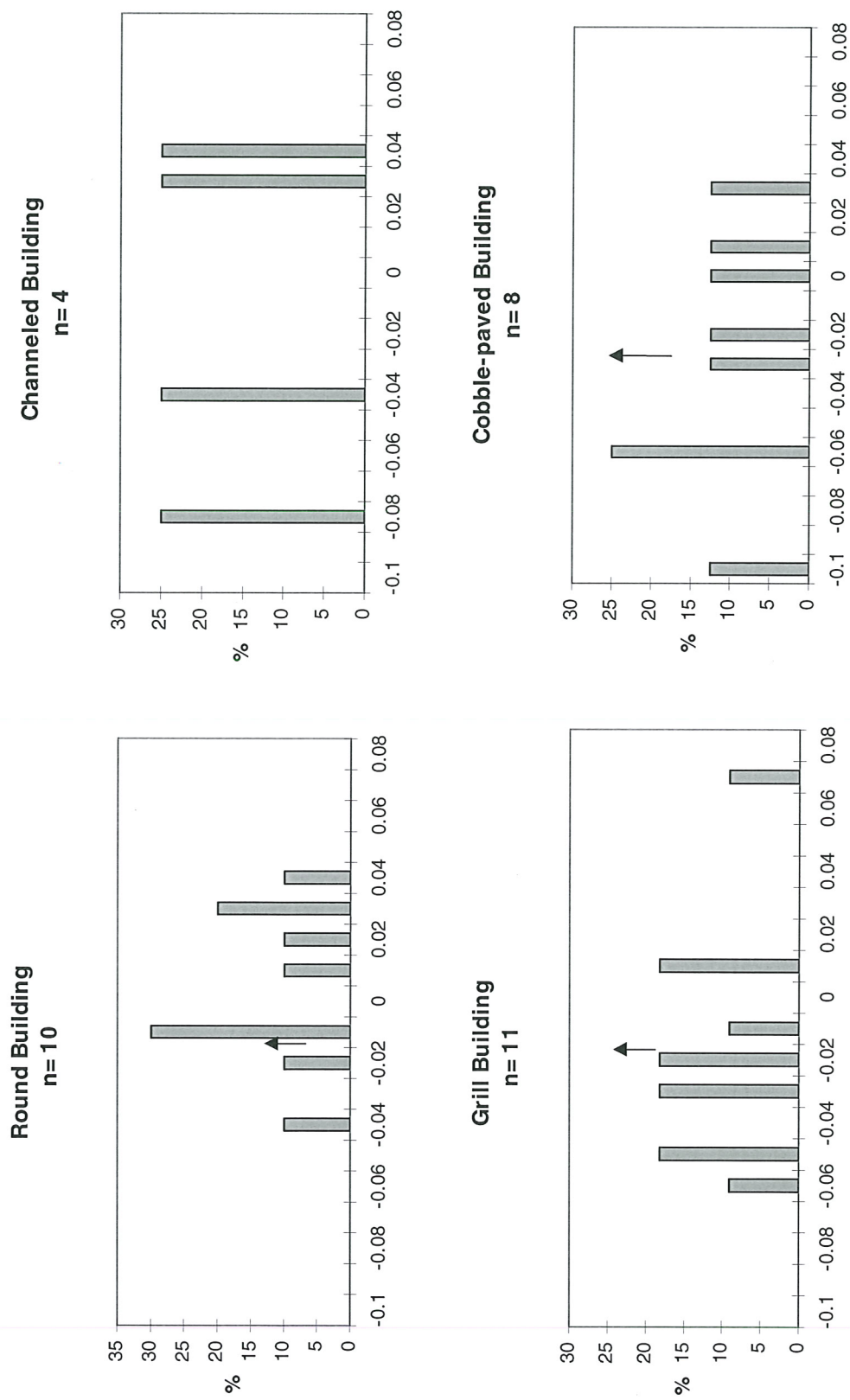


Fig. 1. Log Size Index of cattle from the different subphases (the median value for each subphase is indicated by arrows, the Round Building subphase is earliest).

Çayönü is located to the north of Hilar Village, ca. 7 km. southwest of Ergani in the Diyarbakır Province of southeastern Anatolia (Figure 1 in Hongo and Meadow, this volume). The site lies on the north bank of a small tributary (Boğazçay) of the upper Tigris River, at an elevation of 832 m above sea level (Çambel and Braidwood 1980). Another intermittent stream borders the mound to the north and east. Çayönü Tepesi is an oval, flat mound with dimensions of at least 160 m N-S, and 350 m E-W. The total deposit was thought to be 4.5 m thick, but recent excavations concentrated in the northern and the central parts of the mound have demonstrated that the actual height of the mound was much greater.

The settlement at Çayönü was established on a rich alluvial plain formed by the deposits of an almost completely filled Pleistocene lake. This plain is situated in a zone of contact between the steppe-like plateau lying on the southern flanks of the southeastern Taurus Mountains and the high plateau of eastern Anatolia.

Çayönü was excavated between 1964 and 1991 by the Southeastern Anatolian Joint Prehistoric Project of the Universities of Istanbul and Chicago (Özdoğan 1995). Six main architecturally defined subphases have been identified for the Prepottery Neolithic at the site (Table 2 Hongo and Meadow, this volume). These are from earliest to latest: Round Building (r), Grill Building (g), Channeled Building (ch), Cobble-paved Building (cp), Cell Building (c) and Large Room Building (lr) subphases and date from approximately 10,200 to 8,000 radiocarbon years bp (Özdoğan 1995).

### The cattle assemblage

The total number of cattle bones analyzed for this paper is 522 with a total weight of ca. 18.5 kg. The number of cattle bones in each subphase is as follows:

Round Building Subphase:	n=141
Grill Building Subphase:	n=137
Channeled Building Subphase:	n=122
Cobble-paved Building Subphase:	n=122

The proportion of cattle bones in each subphase is between five and twenty percent of the NISP. This shows that the cattle were one of the most important animals in the diet of the people of Çayönü during the earliest four subphases (Fig. 3 and Table 4, Hongo and Meadow, this volume). Examination of the representation of the various elements does not indicate any changes in different subphases. Although phalanges and metapodials are abundant in all the subphases, skull fragments, teeth and vertebrae are rare. This might be an indication that cattle remains were brought to the site after the animals were butchered at a kill site.

### Size of the Çayönü cattle

Measurements of cattle bones from Çayönü were taken according to the criteria presented by von den Driesch (1976). These dimensions were compared to those of a "standard animal" using the "difference of logs" or "log size index" technique of Meadow (1983). The standard animal is a female *Bos primigenius* from Denmark (Grigson 1989 from Degerbøl and Fredskild 1970, Table 1). The measurements of cattle from Çayönü used in the size index analysis are presented in Appendix I.

There is no change in the size of cattle in the first two subphases (Round Building and Grill Building subphases) (Figs. 1a&b). A decrease in the median value is seen in the Cobble-paved Building subphase (Fig. 1d). In addition, animals smaller than the size range of wild cattle in the Middle East as documented by Grigson (1989) appear in both the Channeled Building and Cobble-paved Building subphases. These are specimens with size index values of -0.08 and -0.10, respectively (Figs. 1c&d).

Dimensions of phalanges and astragali that are not included in the size index analysis are plotted in Figures 2 and 3, together with cattle specimens from other sites in Anatolia for comparison. The measurements of a cattle astragalus from Aşıklı Höyük, a Neolithic site in Central Anatolia, are much

larger than those from Çayönü (Fig. 2). The size (mean) of cattle astragali from Çatal Hüyük is similar to those from Çayönü. The size of a cattle third phalanx from PPN Gritille level A is also similar to those from Çayönü whereas the specimen from Gritille level B is smaller (Fig. 3).

Table 1. Measurements (mm) of the 'standard animal' used to compile Figure 1.

Selected dimensions of the female *Bos primigenius* from Ullerlev, Denmark, measured by Degerbøl (Degerbøl and Fredskild 1970) and Grigson (1989: 81). Abbreviations after von den Driesch (1976).

lower 3rd molar, length at base crown	48.8	*astragalus GLI	83.0
*humerus Bd	97.0	naviculo-cuboid GB	67.0
*humerus Bp	89.0	*metatarsal Bp	62.0
*radius Bp	100.0	*metatarsal Bd	68.0
*metacarpal Bp	74.0	*anterior proximal phalanx Bp	39.0
*metacarpal Bd	73.0	*posterior proximal phalanx Bp	35.5
*tibia Bd	78.0	*anterior middle phalanx Bp	36.0
*calcaneum GL	165.0	*posterior middle phalanx Bp	34.0

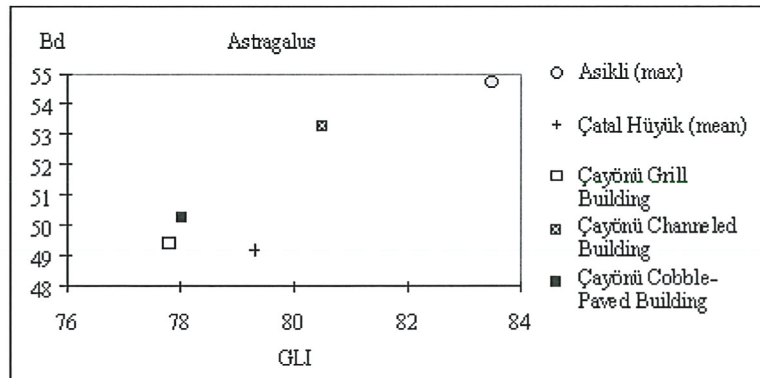


Fig. 2. Dimensions of cattle astragali Bd (Distal breadth) - GLI (Greatest lateral length) from Çayönü, Aşıklı and Çatal Hüyük)

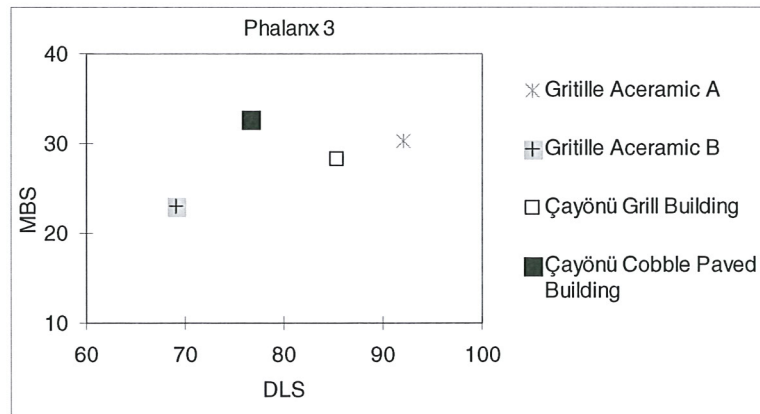


Fig. 3. Dimensions of cattle third phalanges MBS (Breadth in the middle of the sole) - DLS (Greatest diagonal length) from Çayönü and Gritille

Table 2. Skeletal parts used for each age stage based on the sequence of epiphyseal fusion

young ↑             ↓ adult	<b>stage I</b>	scapula: glenoid area
		pelvis acetabulum area
	<b>stage II</b>	distal humerus
		proximal radius
		phalanges 1
		phalanges 2
	<b>stage III</b>	distal metapodial
		distal tibia
		tuber calcanei
		proximal femur
	<b>stage IV</b>	proximal humerus
		distal radius
		distal ulna
		proximal ulna
		distal femur
		proximal femur

Fewer animals survived Stage II and III in later subphases. In the Channeled Building Subphase, 80 % of the animals survived Stage II, while in the Cobble-paved subphase only 56% survived that stage. Some 67 % survived Stage III in the later subphase, however, indicating that either the survivorship for Stage II is too low or that for Stage III is too high (Table 3). It is also of interest that few animals survived Stage IV in any subphase and that the greatest kill-off seems to have taken place between Stages III and IV in all subphases with the possible exception of the Cobble-paved Building subphase.

### Cattle compared with red deer

Cattle were important contributors to the diet at Çayönü in the earlier four PPN subphases, second only to pig overall but nearly equal to red deer during some subphases. When the proportion of red deer and cattle in each subphase is compared, cattle bones are more frequently represented than those of red deer from the first two subphases - Round Building and Grill Building. In the next two subphases - Channeled Building and Cobble-paved Building - however, cattle and red deer bones occur in more

### Cut marks and butchery

Cut marks were observed only on 5.5 % of the cattle specimens from Çayönü: 10 from the Round Building subphase, 9 from the Grill Building subphase, 6 from the Channeled Building subphase and 4 from the Cobble-paved Building subphase. Most of the marks were found on metapodia and astragali (Plates 1 and 2). Because of the small number of specimens with cut marks, it is not possible to define any trend through time. While cut marks are rare, most cattle bones are heavily fragmented.

### Cattle kill-off patterns

Since only few teeth were recovered, the epiphyseal fusion method of evaluating kill-off patterns was employed. Survivorship curves for cattle specimens from PPN levels at Çayönü are shown in Figure 4 with the skeletal parts used for each stage listed in Table 2. There appears to be a trend toward earlier kill-off through time.

Table 3. Cattle epiphyseal fusion patterns by subphase

Phase	Round Building			Grill Building			Channeled Building			Cobble-paved Building		
	#spec	#spec FU	%FU	#spec	#spec FU	%FU	#spec	#spec FU	%FU	#spec	#spec FU	%FU
<b>I</b>	1	0	0%	0	0	-	0	0	-	2	2	100%
<b>II</b>	14	14	100%	15	14	93%	15	12	80%	18	10	56%
<b>III</b>	5	4	80%	14	11	79%	13	10	77%	18	12	67%
<b>IV</b>	4	1	25%	7	1	14%	3	2	67%	3	1	33%
<b>Total</b>	24	19		36	26		31	24		41	25	

Table 4. Proportion of Red Deer to Cattle

	Red Deer	Cattle	Red Deer : Cattle
Round Building	n=36	n=141	1:3.9
Grill Building	n=48	n=137	1:2.8
Channeled Building	n=172	n=122	1:0.7
Cobble-paved Building	n=95	n=122	1:1.3

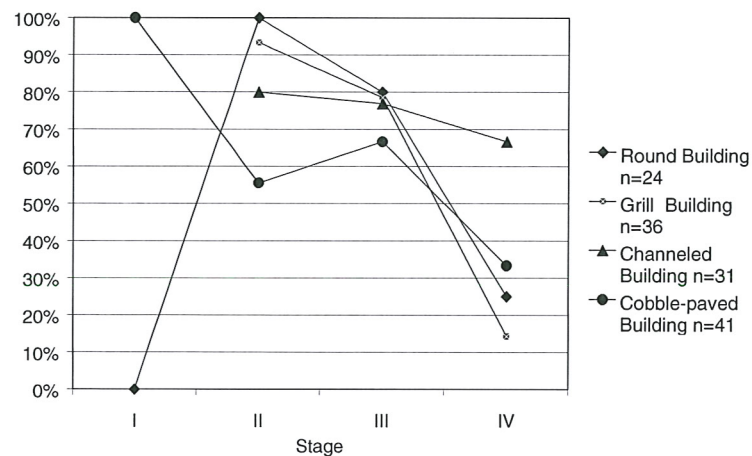


Fig.4. Survivorship curves for cattle from Çayönü

even frequencies, but with red deer bones being even more frequent than those from cattle in the Channeled Building subphase (Table 4). The size of cattle shows an overall trend toward smaller animals through the course of the four subphases, with individuals smaller than Middle Eastern wild cattle appearing in the Channeled Building and Cobble-paved Building subphases. In contrast, there was little change in the size of red deer through the same period (İlgezdi 1999, and in this volume). There is a similar contrast in kill-off, with a higher proportion of younger cattle being represented than is the case for red deer. Overall there is a trend of change in the exploitation patterns for cattle, while those for red deer remained quite similar through the four subphases analyzed.

## Conclusion

Earlier kill-off and the presence of a few specimens from small animals in later subphases suggest that changes in patterns of cattle exploitation at Çayönü took place by the time of the Channeled Building subphase, which is contemporary to the early PPNB in Levant. These trends are similar to those defined for pigs by Hongo and Meadow (this volume). Due to the small number of cattle specimens, however, it is difficult to determine whether these changes indicate the beginning of cattle domestication at the site. Remains from earlier excavation seasons need to be studied to increase the assemblage size. In addition, assemblages from the later Cell Building and Large Room subphases as well as from the Pottery Neolithic Level need to be analyzed in order to see whether the trends of change observed in the Channeled Building and the Cobble-paved Building subphases continue into later periods at the site.

## Acknowledgements

This paper is a short and updated version of my M.A. thesis submitted to Prehistory Section of Institute of Social Sciences of the İstanbul University in 1998. I am very grateful to professors U. Esin, M. Özdoğan and Dr. A. Özdoğan, other faculty members for their support. I would also like to thank R. J. Braidwood and H. Çambel. The analysis was carried out in the Prehistory Laboratory of the İstanbul University, using modern comparative skeletons. The analysis was supervised by Dr. H. Hongo (Kyoto University, Japan) and Dr. R.H. Meadow (Harvard University, USA). This work was supported by the Research Fund of the İstanbul University, Project Number: T- 287 / 301096.

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Appendix I. Measurements (in mm) of Çayönü cattle bones used for size index analysis

a - HUMERUS						
Specimen #	20	2000	2182	41	2326	2313
Phase	Round	Round	Channeled	Channeled	Channeled	Cobble-paved
Bd		94.3	87.5	69.8	99.5	
BT	88.8	90.5	83.9	63.0	91.0	84.0

b - RADIUS		
Specimen #	1	2309
Phase	Round	Cobble-paved
Bp	109.4	109.4

c - METACARPAL		
Specimen #	2055	2174
Phase	Round	Grill
Bd	73.4	65.1

d - ASTRAGALUS					
Specimen #	2355	2419	2439	2447	2320
Phase	Channeled	Cobble-paved	Cobble-paved	Cobble-paved	Cobble-paved
GLI	80.5	71.8	65.1	84.4	78.0

e - ANTERIOR PHALANX I			
Specimen #	2155	2169	2170
Phase	Grill	Grill	Grill
Bp	38.9	37.4	36.5

f - POSTERIOR PHALANX 1							
Specimen #	2015	2054	905	115	2034	2035	2168
Phase	Round	Round	Round	Grill	Grill	Grill	Grill
Bp	32.2	38.1	33.8	33.5	31.8	31.6	35.2

g - POSTERIOR PHALANX 2					
Specimen #	26	901	2023	2119	2331
Phase	Round	Round	Grill	Grill	Channeled
Bp	35.5	38.1	39.7	32.5	37.1

h - METATARSAL			
Specimen #	2441	2442	2150
Phase	Cobble-paved	Cobble-paved	Grill
Bp	57.2		60.0
Bd		72.2	



Plate 1 (a-b). The traces of cutting on cattle astragali.



Plate 2 (a-b). The traces of cutting on cattle metapodials