The Linearbandkeramik farmers of Meidling, their livestock and gamebag

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In 1977 part of an early Linearbandkeramik settlement near Meindling was excavated by the IPL; ca. 453 bones of cattle, sheep, goat, pig, dog, wild boar, roe deer, red deer and aurochs were collected. The percentage of domestic animals was resp. 83.4 and of the wild mammals 16.6% in terms of numbers of bones. For bone weight, these figures were 90.8% and 9.2%.

It is proposed that a percentage higher than 10% of wild mammals may be connected with the proximity of broad river valleys.

1. Introduction

In 1977 the *Instituut voor Prehistorie* of Leiden University excavated a small part of an early Linearbandkeramik settlement north of the village of Meindling in Bavaria in Southern Germany. The excavation was directed by Professor P.J.R. Modderman, at that time director of the *Instituut* (Modderman, this volume).

The settlement was situated on the left bank of the Ödbach, a small stream flowing SW-NE in a loessic plain, which joins the Irlbach stream north of Haberkofen (Groenendijk this volume) and reaches the river Danube east of Irlbach (fig. 1). The total length of the river system is 15 km. The sources of the Ödbach are some 5 km southwest of Meindling.

Near the village of Irlbach a second settlement of the earliest Linearbandkeramik was found. During a survey in the early eighties a third settlement of this period was found near Haberkofen. In the area between Siebenkofen and Haberkofen five settlements of the younger Linearbandkeramik came to light (fig. 1).

Meindling was excavated in the first place because traces of the earliest Linearbandkeramik had been found at that place, but later phases of the Linearbandkeramik were present as well. Also a pit of the Münchshöfener culture and two of the Hallstatt period were found. However, the faunal material belongs mainly to the earliest Linearbandkeramik phase. Four ^{14}C dates are available for the Linearbandkeramik, ranging from GrN-8687:6380±130 BP through GrN-9139:6190±100 and GrN-8688:6130±40 BP to GrN 9138:6030±60 BP, indicating a habitation period of c. 350 years. Nine houses were partly excavated (Modderman this volume).

2. The faunal material

The bones were mainly retrieved from pits situated outside the houses, but occasionally also from a posthole or the foundation trench of a wall. The pits were not very deep and the conservation of the bones in the upper part of the pits was very poor; in the lower parts the conservation ranged from poor to fairly reasonable. Part of the bones had been in contact with fire and were to some degree calcined. The bones have been counted (tabs. 1, 2, 3) and weighed (tabs. 2, 3). When considering the information that the bone-counts and the bone-weight might yield, we have always to keep in mind that, owing to the varied conservation of the bones and the time-span of ca. 350 years that the habitation covers, these can be no more than approximations. Of the ca. 455 bones, 254 could be identified to species. Fifty-three bones could be identified to family or possible family, and another 108 to the size class of the animal they had belonged to. For 40 bones it was not possible to make an assessment (tabs 1, 2).

3. The species

The bones belonged to nine species; five domesticated mammals, four wild mammals and one wild bird (tab. 1). Owing to the poor conservation and the fragmentation of the bones it was in many cases not possible to measure the bones (tab. 5). In the case of the cattle and pig remains I have separated the bones of the wild parent species — aurochs and wild boar — from the domesticates — domestic cattle and domestic pig — to the best of my ability; on considerations of size, thickness, etc.

3.1. Dog – *Canis familiaris*

The caput of a femur of a dog was found. It was not yet fused with the *diaphysis* and belonged to an animal not older than 6-9 months. Dogs were probably common animals in Bandkeramik villages. They are unlikely to have been on the menu.

3.2. Domestic pig – *Sus domesticus*

Of the domestic pig, 42 bones, weighing 610 gr., were collected. With the exception of the skull and toes all skeletal parts are present. Pigs were killed at various ages,

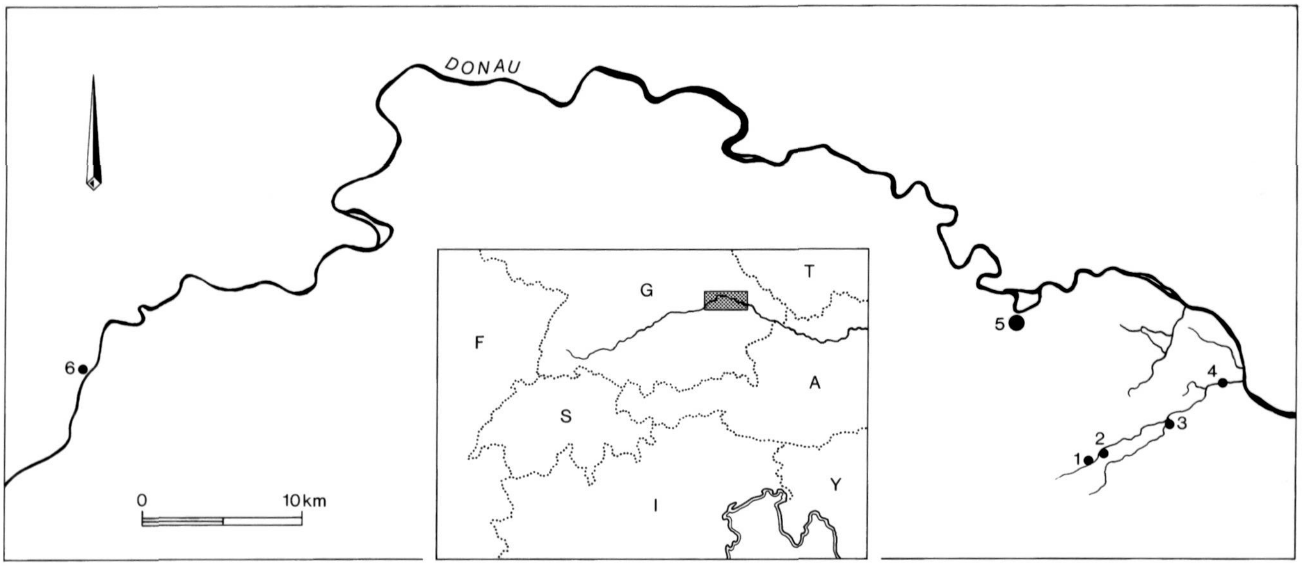

Figure 1. The geographical situation. 1. Meindling, 2. Siebenkofen, 3. Haberkofen, 4. Irlbach, 5. Straubing-Lerchenheid, 6. Hienheim.

Table 1. The number and weight of the bones that could be identified to species.

Species	N	%	Weight	%
domestic mammals:				
Canis familiaris	1	0.47	2.7	0.02
Sus domesticus	42	19.90	610.1	5.51
Ovis aries	2	0.94	108.6	0.98
Capra hircus	2	0.94	107.0	0.96
Capra/Ovis	32	15.16	266.4	2.40
Bos taurus	132	62.55	9964.1	90.10
sum	211		11058.9	
wild mammals:				
Sus scrofa	3	7.14	113.1	10.08
Capreolus capreolus	15	35.71	68.4	6.09
Cervus elaphus	15	35.71	826.5	73.68
Bos primigenius	9	16.66	113.7	10.13
sum	42		1121.7	
birds:				
Corvus corone	1		0.4	

insofar as this can be concluded from the few data available on the age at which individuals were killed (tab. 4).

3.3. Domestic sheep – *Ovis aries*

Two horncores of sheep were found. They were broken.

3.4. Domestic goat – *Capra hircus*

Of domestic goat, a horncore and a metacarpus could be identified. The horncore was lenticular in cross-section and curved slightly backward.

3.5. *Capra/Ovis*

Of goat and sheep, 32 bones could not be identified to species. With the exception of the skull and toes all skeletal parts are represented (tab. 3). One mandible was of a ca. 3-month-old kid, other animals reached maturity (tab. 4).

3.6. Domestic cattle – *Bos taurus*

The majority of the bones that could be identified to species belonged to domestic cattle: 62 percent by number

Table 2. The number and weight of the bones that could not be identified to species.

	N	Weight
Bos sp.	9	222.3
cf *Bos*	1	113.7
cf *Capra/Ovis*	23	55.7
Sus sp.	9	87.5
cf. *Sus*	11	57.7
The size of Bos/Cervus	60	959.3
The size of Capra/Ovis/Sus	48	250.8
?	40	181.7

and even 90 percent by bone weight. All parts of the skeleton are represented (tab. 3). Calves as well as mature animals were slaughtered (tab. 4).

3.7. Wild boar – *Sus scrofa*

Three bones of the wild boar could be identified (tables 1, 3).

3.8. Roe deer – *Capreolus capreolus*

Of the roe deer 15 bones could be identified (tabs 1, 2). Two mandibles were of animals between 3-4 and 12-13 months of age.

3.9. Red deer – *Cervus elaphus*

Of red deer also 15 bones were retrieved (tabs 1, 2). A left P_3 indicates that animal not yet two years old was hunted and killed.

3.10. Aurochs – *Bos primigenius*

Nine bones of the aurochs could be identified with certainty, the majority belonging to the foreleg.

3.11. Crow – *Corvus corone*

The distal part of right femur of a crow was found (tabs 1, 2).

3.12. Mites and insects

Sample no. 367 was a big lump of loess in which poorly preserved bone and teeth fragments were visible. The loess sample was investigated by Dr. J. Schelvis to see whether it contained remains of mites and insects. The sample was sieved over a 106 μm mesh sieve and subsequently a Paraffin-Flotation was carried out to extract all chitinous remains. This resulted in the recovery of only very few arthropod remains (< 10), most of which were very poorly preserved. Two remains of oribatid mites were found, one of which was tentatively identified as a representative of the genus *Tectocepheus*.

The conclusion of this small pilot study is that the usefulness of these samples for the analysis of arthropod remains is very restricted. The shallowness of the sampled features is the most probable explanation.

4. Bone tools

Part of the *diaphysis* of ulna of cattle was used to make a small chisel: No. 263/cb.

What could have been a rib-point, was made from a rib of cattle or deer. The 'point' was rounded through use: Nr. 277.

5. Discussion

Recently Döhle (1993) in an article that appeared in the *Festschrift für Haus-Hermann Müller* discussed all that is known about stockbreeding and hunting in Bandkeramik times.

Müller (1964) was the first to work systematically on the faunal remains of Bandkeramik sites. He found that in most of the Bandkeramik sites hunting was of no great importance, never reaching more than 10% of the identified bones. At Meindling the percentages for domestic and wild mammal species are 83.4 and 16.6 in terms of number of bones or 90.8 and 9.2 in terms of weight. The 10% limit for wild-mammal bone numbers is exceeded by a mere 6% and 16% is low compared with two other sites in southern Bavaria: Straubing-Lerchenheid (37.2%) and Hienheim (41.0%) (Döhle 1993; Clason 1977).

The generally low number of bones of wild animals in Bandkeramik sites is not surprising. The deciduous forest that covered those parts of Europe that were settled by Bandkeramik farmers were not teeming with wildlife. Iversen in 1973 already pointed to the fact that the fullgrown deciduous forest in Europe offered poor grazing for ungulates and thus not much food for hunter-gatherers and their successors, the Neolithic farmers. It was therefore impossible for the Bandkeramik farmers to hunt for food on a large scale.

There are also a few other exceptions to the 10% limit and an explanation Döhle (1993) offers is (following Sielmann 1972) that the Bandkeramik farmers settled in areas with different climates in different *Ökologie Kreise*. *Ökologie Kreis* A was warm and dry, *Ökologie Kreis* B had more rain and even higher temperatures than *Kreis* A.

However there may be a different and/or additional explanation for the high percentage of wild animals at Hienheim and Straubing-Lerchenheid. Both settlements were situated in the vicinity of the Danube valley. At that time the Danube had no fixed streambed and next to the mainstream small streams must have existed. In contrast to the woods of the higher loessic plateaus, the *Auenwälder* of the Danube valley would have been a favourable biotope for small and large game animals, which were exploited by the inhabitants of Hienheim and Straubing-Lerchenheid.

Table 3. A survey of the distribution of the bones.

	Bos taurus	*Bos* sp.	*Bos primigenius*	cf. *Bos*	*Ovis aries*	*Capra hircus*	*Capra/ Ovis*	cf. *Ovis/ Capra*	*Sus domesticus*	*Sus* sp.	*Sus scrofa*	cf. *Sus*	*Canis familiaris*	*Capreolus capreolus*	*Cervus elaphus*	*Corvus corone*
Antler	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	-
Horn-cores	4	1	-	-	2	1	-	-	-	-	-	-	-	-	-	-
Cranium	3	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-
Dentes	1	-	-	-	-	-	3	-	4	-	-	-	-	-	-	-
Mandibula	11	-	1	-	-	-	1	-	5	2	-	1	-	2	-	-
Dentes	5		-	-	-	-	-	-	2	-	-	-	-	-	2	-
Dentes	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atlas	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Epistropheus	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vertebrae	15	-	-	-	-	-	6	3	2	3	1	3	-	2	-	-
Costae	16	1	-	-	-	-	1	20	-	-	-	7	-	-	-	-
Scapula	6	-	1	-	-	-	-	-	2	-	-	-	-	1	1	-
Humerus	8	-	2	-	-	-	-	-	3	-	-	-	-	1	-	-
Radius	10	-	4	-	-	-	4	-	1	1	-	-	-	2	2	-
Ulna	4	-	-	-	-	-	-	-	5	-	1	-	-	-	2	-
O.carpi	8	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Metacarpus	1	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-
Pelvis	4	-	-	-	-	-	1	-	3	2	1	-	-	1	1	-
Femur	5	2	-	-	-	-	2	-	5	-	-	-	1	1	1	1
Patella	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tibia	4	-	-	-	-	-	1	-	3	-	-	-	-	1	1	-
O.centrotarsale	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Calcaneus	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
Astragalus	6	-	-	-	-	-	4	-	1	-	-	-	-	1	-	-
Metatarsus	4	-	-	-	-	-	1	-	1	-	-	-	-	2	-	-
Metacarpus/metatarsus	-	-	-	-	-	-	2	-	-	1	-	-	-	-	1	-
Phalanx I	5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Phalanx II	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 4. Age at death. If not otherwise stated the age is given according to the criteria of Habermehl (1975, 1985). The fusion of diaphyses with the epiphyses of the tibia of the beaver according to Iregren/Stenflo (1982). p.= proximal; d= distal; f= fused; u= unfused; m= month; y= year.

Canis familiaris			
Skeleton		N.f	N. u
6-9 m		-	1
femur p.			
Sus domesticus			
dentition			N
13-22 m	P_3 M_1 M_2(M_3 not erupted)		2
18-24 m	M_3		2
Skeleton		N, f	N, u
1 y	humerus d.	2	-
2-2.5 y	tibia d.	2	1
3-3.5 y	radius d.	-	1
	ulna d.	1	1
	femur p+d	-	2
4-7 Y	vertebrae	-	2
Capra/Ovis			
			N
3 m	P_3 M_1 erupting		
2 y	P_2 P_3 P_4 M_1 M_2 M_3		3
Skeleton		N,f	N, u
15-20 m	tibia d.	1	-
3 y	calcaneum p.	-	2
3.5 y	radius d.	-	1
	femur d+p	1	1
4-5 y	vertebrae	1	2
Bos taurus			
dentition		N	
1.5 y	P_3 M_1 (M_2 erupting)	1	
3 y	M_1 M_2 M_3	2	
Skeleton		N, f	N, u
7-10 m	scapula	2	-
12-15 m	radius p.	3	-
	phalanx II p.	1	1
15-20 m	humerus d.	2	2
20-24 m	phalanx I p.	2	2
2-2.5 y	tibia d.	3	-
	metatarsus d.	3	-
c. 3 y	calcaneum	1	-
3.5-4 y	radius d.	4	1
	femur p+d.	2	2
	tibia p.	1	-
4-5 y	vertebrae	3	6

Meindling however was situated some 10 km away from the Danube valley and the way to the valley was blocked by another contemporaneous early Bandkeramik settlement near Irlbach (fig. 1).

If there still were extensive woods in the close surroundings of Meindling, these could not have supported much big game. The relatively high percentage of roe deer however indicates that the landscape was fairly open

Table 5. The measurements in mm.
(-) measurement is not certain, 1) length alveolus

Bos taurus - Bt, *Bos primigenius* - Bp	Bp		Bt				
Mandibula	66	M3	251				
Height after M_3	87.5						
Max. Length M_3	40.0[1)]		36.5				
Max. Width M_3	-		13.5				
	Bt	Bt	Bp				
Scapula	66	291	338				
Smallest hight of the neck	60.0	-	70.0				
Lenght of the articular surface	-	61.0	68.5				
Width of the articular surface	(47.0)	-	57.0				
	Bt	Bt	Bt	Bp			
Humerus	289	66	289	87			
Max. distal width	79.5	84.5	(85.0)	(97.0)			
Width of the trochba	(74.0)	77.0	(78.0)	-			
	Bt	Bp	Bp	Bp	Bt	Bt	Bt
Radius	330	284	66	110	66	182	289
Max. prox. width	67.5	85.0	87.0	100.5	-	-	-
Width prox. art. surface	62.5	79.0	79.5	-	-	-	-
Max. dist. width	-	-	-	-	76.0	77.0	81.5
Max. width dist. art. surface	-	-	-	-	70.5	68.0	79.5
	Bt						
Metacarpus	66						
Max. prox. width	73.5						
Min. width diaphysis	40.0						
	Bt						
Pelvis	66						
Length acetabulum	83.5						
	Bt						
Femur	66						
Max. width caput	58.5						
	Bt	Bt					
Tibia	66	238					
Max. prox. width	102.0	-					
Max. dist. width	-	70.0					
	Bt	Bt	Bt	Bt			
Metatarsus	367	66	367	367			
Max. prox. width	45.5	-	-	-			
Max. dist. width	-	48.5	51.0	55.5			
Max. width over the condyles	-	61.5	54.0	69.0			
	Bt	Bt	Bt				
Astragalus	323	277	257				
Max. lat. length	-	71.0	73.0				
Max. med. length	59.0	66.0	63.5				
Width trochlea	34.0	44.5	45.0				

Thickness lat.	-	39.5	37.5
Thickness med.	33.5	36.0	(37.0)
	Bt		
Centrotarsale	251		
Max. width	61.0		
	Bt	Bt	
Phalanx I	276	66	
Max. lat. length	62.5	63.5	
Max. prox. width	33.0	31.0	
Max. dist. width	27.0	27.5	
Smallest width of the diaphysis	25.5	26.0	
	Bt	Bp	
Phalanx II	276	338	
Max. lat. length	40.0	51.5	
Max. prox. width	29.5	39.5	
Max. dist. width	26.0	30.0	
Smallest width of the diaphysis	23.0	30.0	
	Bt		
Epistropheus	289		
Max. width cranial art. surface	96.0		
Max. width dens	46.5		
Sus domesticus - Sd			
Sus scrofa - Ss			
	Sd	Sd	
Humerus	369	204	
Max. dist. width	40.5	42.0	
Max. width trochlea	31.5	31.5	
	Sd	Sd	
Ulna	305	93	
Width art.surface	19.0	(24.0)	
	Ss		
Pelvis	66		
Length-acetabulum	43.5		
	Sd	Sd	
Tibia	115	289	
Max. dist. width	27.5	29.5	
Capra hircus			
Horncore	289		
Maximum diameter at the base	37.5		
Minimum diameter at the base	25.5		
Capra/Ovis			
Radius	289		
Max. dist. width	26.0		

Femur	369	
Max. dist. width	34.0	
Metatarsus	367	
Max. prox. width	16.5	
Astragalus	367	305
Max. lat. length	22.5	31.5
Max. med. length	24.0	29.5
Width trochlea	15.0	20.0
Centrotarsale	92	
Max. width	24.0	
Capreolus capreolus		
Scapula	129	
Max. lenght proc. art.	23.0	
Length art. surface	21.5	
Width art. surface	30.5	
Radius	240	
Max. distal width	26.5	
Max. width dist. art. surface	23.5	
Min. width diaphysis	16.0	
Tibia	305	
Max. dist. width	24.5	
Cervus elaphus		
Scapula	66	
Smallest height of the neck	36.5	
Max. length art. surface	46.5	
Min. length art. surface	43.0	
Radius	251	
Max. prox. width	51.5	
Min. width diaphysis	32.0	
Ulna	167	251
Width art. surface	30.0	31.5
Pelvis	66	
Length acetabulum	50.5	
Femur	66	
Max. dist. width	61.5	
Tibia	367	
Max. dist. width	50.5	
Corvus corone		
Femur	?	
Max. dist. width	10.77	

(Bakels, this volume). In other parts of the Bandkeramik realm as well, a high percentage of wild animals, as found in Juvigny in the Ile de France (Döhle 1993), may be explained by the vicinity of a wide river valley with rich wildlife. I had no time to pursue this point any further at present, but it might be a worthwile topic for future research. I know however that there was no wide river valley in the vicinity of the settlement at Bylany in Bohemia (Clason 1968).

As for Meindling and the Ödbach system in southern Germany, it would be possible by excavating the other Bandkeramik sites found in that area to see whether there is a gradient showing a high percentage of wild animals near the Danube valley, which declines in the villages further to the southwest.

6. Acknowledgements

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