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THE ARCHAEOZOOLOGICAL FINDS FROM TEL MIKHAL (TEL MICHAL)

MOSHE SADE

Archaeozoological remains from the Middle Bronze Age and Persian period were discovered in the 1996 excavations at Tel Mikhal. The remains were analyzed according to the system developed and updated by Klein and Cruz-Uribe (1984). The Middle Bronze Age osteological material is scant. Three bones found in separate loci belong to a cow and a sheep/goat. In contrast, the abundant Persian-period animal finds are represented by 127 baskets from 71 loci. These include 1320 remains from cattle (*Bos taurus*), sheep/goat (*Ovis aries*), dogs (*Canis Familiaris*), pigs (*Sus scrofa*), fallow deer (*Dama dama mesopotamica*) and sea mollusks (*Mollusca*) (Tables 1 and 2).

Table 1. Domesticated Mammal Bones from the Persian Period

Species	Sheep and Goats	Cattle	Pig	Dog	Camel	Total
Horn core	1	16				17
Cranium	17	28				45
Maxilla	4	3				7
Orbit	2	11				13
Mandibula	13	66	1	2		82
Molar	23	72		2		97
Pre molar	12	12	1			25
Canine			1	4		5
Atlas	1	5				6
Axis		2				2
Cervical	1	6				7
Thoracic	2	10				12
Lumbar	14	61				75
Sacrum		7				7
Coccyx	1	2				3
Unidentified vertebrae		5				5
Scapula	23	39				62
Humerus	15	37				52
Radius	7	29				36
Ulna	8	19				27
Os carpale	1	1				2
Metacarpus	2	13				15
Pelvis	10	29				39
Femur	6	19				25
Tibia	1	24		1		26

Table 1. Domesticated Mammal Bones from the Persian Period (cont.)

Species	Sheep and Goats	Cattle	Pig	Dog	Camel	Total
Os tarsale	2	3				5
Calcaneus	3	18				21
Astragalus	1	19				20
Metatarsus	4	18		1 (III)(III)		23
Metapod	71	105	2			178
Costae	115	224				339
Phalanx 1	5	16			1	22
Phalanx 2		7				7
Phalanx 3		3				3
Total	*365*	*929*	*5*	*10*	*1*	*1310*
%	*27.79*	*70.49*	*0.4*	*0.8*	*0.1*	*99.2**

* Percentage of total animal remains, both domesticated and wild

Table 2. Traces of Fallow Deer and Sea Mollusks from the Persian Period

Species	Fallow deer	Sea mollusks	Total
Horn Core	1		1
Glyeymeris		4	4
Murex Brandaris		1	1
Murex Trunculus		1	1
Casis Saburon		2	2
Cypraea Spurca		1	1
Total	*1*	*9*	*10*
%	*0.1*	*0.7*	*0.8**

* Percentage of total animal remains, both domesticated and wild

Cattle are the predominant species by contributing over 70% of the total animal bones collected. From an archaeozoological standpoint, this extremely high level of cattle bones is exceptional, especially in light of the relatively lower amounts of finds from other sites. Clearly, this is a fascinating result for osteological finds in Israel. In contrast to the finds here, the Persian-period remains of the more extensive 1989 excavation at Tel Mikhal, included a total of c. 35% for cattle bones and c. 55% for sheep and goat (Hellwing and Feig 1989). Excluding sheep and goat remains, other animal species are negligible.

Minimum Number of Individuals (MNI) analysis requires the metapodia (leg) bones alone for counting individuals (Table 3). Considering the number of left humeri, remains exist of 7 sheep and goats, and 18 humeri of cattle. There was one dog. Solitary examples of pig, camel and fallow deer are presented in Table 4.

If we consider only the domesticated mammals by excluding deer, the percentage of cattle, the predominant branch of animal husbandry at the site increases slightly to about 64.3%. Since raising cattle demands considerable effort, especially large amounts of dry food and water,

Table 3. Left and Right Bones in Cattle, Sheep and Goat and Dog

Species / Bones		Sheep and Goat		Cattle		Dog	
		R	L	R	L	R	L
Humerus	P		1	2	3		
	D	4	7	14	18		
Radius	P		4	7	12		
	D			3	2		
Ulna	P	2	1	9	9		
	D		1				
Metacarpus	P	2		6	4		
	D	1					
Femur	P	1	2	1	7		
	D	1	1	1	6		
Tibia	P			4	2		
	D		1	10	6		1
Calcaneus		2	1	4	13		
Astragalus		1		13	6		
Metatarsus	P	1	3	8	10	1	
	D					1	

P = Proximal; D = Distal

Table 4. Minimum Number of Mammals in the Persian Period

	Cattle	Sheep and Goat	Domestic Dog	Domestic Pig	Camel	Fallow deer	Total
Minimum number per species	18	7	1	1	1	1	29
%	62.1	24.2	3.5	3.5	3.5	3.5	100

we assume that the residents at Tel Mikhal must have been relatively affluent. Camels probably arrived at the site along with trade caravans. Apparently, the fallow deer (a hint of a nearby natural forest) was hunted and brought to the site.

Locus 250 in Area A1 consisted mostly of cattle bones. This single locus constitutes 92.83% of the total animal remains.[1] Most of these were so severely burnt that the inside of the bones was turned into white powder and the outer surfaces were blackened from carbon. Loci 247, 203 and 264—south, west and north of L250—all lack osteological material. It is assumed that some cultic activity occurred in this place. Stern points out that the nearby temple excavated by Avigad was located just 400 meters from Tel Mikhal (Stern 1973:21; Avigad 1961).

Of the sheep and goat long bones, all were severed either at lower section of the distal humerus or at the upper part of the proximal radius and ulna. On the hind legs, the lower portion of the distal femur was cut. Few small metacarpi were found, perhaps indicating that these were not used as food.

The cattle bone finds were similar to those of sheep and goat (Table 5). The front leg bones

Table 5. Upper and Lower Sections of Bone: Cattle, Sheep and Goat

	Sheep and Goat		Cattle	
Bones	P	D	P	D
Humerus	1	11	5	32
Radius	4		19	5
Ulna	3	1	18	
Metacarpus	3		10	1
Femur	2	4	8	7
Tibia		1	6	16
Metatarsus	4		18	

P = Proximal; D = Distal

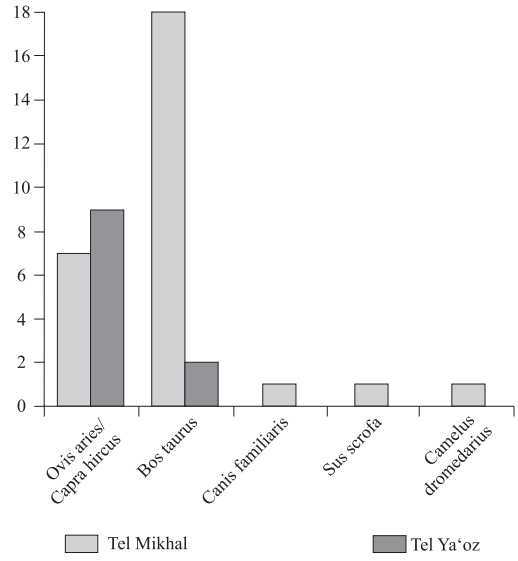

Fig. 1. Comparison of Domestic Mammal bones found at Tel Ya'oz and Tel Mikhal in the Persian Period.

were typically severed at the lower part of the distal humerus or the upper part of the proximal radius and ulna. The hind leg was cut at the lower part of the distal femur or the upper part of the proximal tibia. In contrast with sheep and goat bones, where few remains of hind hooves were found, cattle bones were severed at either the lower part of the distal tibia or at the upper part of the proximal metatarsus.

Assuming that these bone fragments are the remains of those cooked for food, there was a tendency to eat the cuts of meat derived from the area of the shoulder and foreleg, as well as the hind legs. This is especially notable with the cattle bones, the predominant branch of livestock raised at the site. It is reasonable to suppose that the local population raised cattle, and consumed the choicest parts themselves.

Animal remains were also found at Tel Ya'oz not far from Kibbutz Palmaḥim (Sade, this volume), where the ratio between sheep and goat to cattle is 6:1—probably due to the relatively small excavation of this site. Nonetheless, comparing its osteological material with that of Tel Mikhal during the Persian period reveals an inverse proportion of sheep and goat to cattle (Fig. 1).

Regarding the ethnicity of the population during the Persian period, these finds might suggest that both Phoenicians and Samaritans lived together at Tel Mikhal. The presence of pig bones at Tel Mikhal constitutes an unequivocal religious marker that could indicate a Phoenician population. Based on the osteological evidence alone (i.e., five pig bones of 1320 found at the site), we might entertain the idea that only a minority of the residents were Phoenicians. Further evidence on the ethnography of the population was revealed by Avigad, who uncovered a Samaritan cemetery along with the temple during his excavation at nearby Makmish in 1959 Avigad (1960; 1961; 1993).

NOTE

[1] This locus contained 272 cattle, 20 sheep and goat, and the remains of one sea mollusk, for a total of 293 specimens.

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