Animals in Funerary Rituals at the El-Zuma Cemetery

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1 Introduction

Animal remains have been coming to light in the tombs at El-Zuma since regular excavations were first conducted at this site in 2005. The bone remains from the first two seasons (2005 and 2007) were analysed and published by Marta Osypińska (2005; 2010) and they are not included in this volume. Some comments concerning the results of this earlier work are, however, made in this chapter. The rest of the animal bones, discovered between 2009 and 2012, and partially in the 2007 season, remained in storage awaiting analysis till 2013. The bone fragments from 2013–2018 were identified during the excavation seasons immediately after their discovery. Some of the material analysed during this study has already been published (Iwaszczuk 2015; Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21), but some supplementary remarks are made further on herein.

The state of preservation of the tumulus structures is described earlier in this volume (see Chapters 3 and 5). It is, however, important to mention that the graves were looted sometime after the funerary rituals had taken place, which is reflected in the plans and profiles of the various grave structures. In the case of most of the type II and III tumuli the burial chamber (chamber 1) was looted but the additional chambers were left untouched with the material remaining *in situ*. There were, of course, some exceptions to that pattern (e.g. the ceiling of chamber 2 in T.11 and T.12 was damaged during the looting). Chamber 3 in T.9 and chamber 4 in T.26 could also have been looted, as the ceilings of those graves had collapsed, but the damage to the ceiling could also be attributable to natural processes, such as the humidity of the rock weakening the structure of the ceiling. In other cases the collapse of the ceilings was probably caused by natural factors.

2 Material and Methods

The number of excavated fragments was high: 15,191 bone and tooth fragments from 20 tumuli (nos. 1, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 24, 26, and 28) and two almost-complete skeletons of small rodents (with skin) excavated

from T.6 were analysed. Additionally, in T.13 five fragments of one bivalve shell were found. A few animal bones were discovered in chamber 2 of T.23, according to the field documentation; however, they were subsequently lost when the finds were moved to a new storage location. A similar situation concerned animal remains from an original deposit found in T.22. Only 31 fragments belonging to 13 bones from the re-exploration of this part of the tomb were submitted for analysis. These remains have not been included in this analysis, as they might have come from the recent sand layers accumulated in the vicinity of the tumuli.

Animal bones were identified to a zoological taxon and anatomical element. Ovicaprines were identified according to standard methods (Schramm 1967; Zeder and Lapham 2010; Zeder and Pilaar 2010). Estimation of the age of individuals was carried out based on the fusion of long bone epiphyses with shafts, the fusion of pelvic bones and the degree of development of the glenoid articulation of the scapula (Kolda 1936). Tooth development was also taken into consideration (Lutnicki 1972); however, teeth were very seldom found among the animal remains in the excavated graves. The morphotypes of sheep and cattle were analysed on the basis of measurements according to Driesch's (1976) method and coefficients estimated for sheep by Teichert (von den Driesch and Boessneck 1974) and for cattle by Matolcsi (von den Driesch and Boessneck 1974) and Fock (1966). The minimum number of individuals (MNI) was calculated for all species recovered from the tumuli using the most frequent bone elements in the assemblages, also taking into consideration the size of the bones and, in some cases, the age and sex of the individuals. In the case of animals other than cattle and sheep (e.g. donkey, camel, horse, and goat) measurements were taken but, as such remains were very scarce, further analysis on the morphotypes of these animals was impossible. Nevertheless, all of the measurements are listed in Table 8.1.

TABLE 8.1 Measurements of mammal bones from El-Zuma Tumulus 1

CATTLE					
Scapula			Radius		
SLC			Bp		
			7 ¹		
45			77.2		
41.5			84.2		
Metacarpal				Tibia	
Bp	Bd	SD	DD	Bd	
64.8		36.3	26.4	57	
	59.8				
DONKEY					
Humerus					
Bd					
58					
Metacarpal					
GL	GLI	Bp	Bd	SD	DD
181.5	176.8	37.8	34.1	23.7	20.1
HORSE			CAMEL		
Pelvis			Talus		
LA			GLm		
69.4			74		

Tumulus 3

CATTLE		
Scapula		
GLP	BG	SLC
58.4	51	57
Humerus		
Bd		
70.5		
Radius		
Bp	Bd	SD
84.5	77.7	44.8
Tibia		
Bp	Bd	SD
	54.6	
95	58.2	41.3
SHEEP		
Humerus	Pelvis	
Bd	LA	
32.5	22.8	

TABLE 8.1 Measurements of mammal bones from El-Zuma (*cont.*)
Tumulus 4

CATTLE				
Scapula	Humerus	Radius	Meta-carpal	Pelvis
SLC	Bd	Bd	Bd	LA
	82	65.7	48.3	56.3
	56.8		59.4	
47.2	63		47	
Femur		Tibia		
Bp	Bd	GL	Bd	
120.3			55.9	
	/85/	349	59.3	
			57.3	
Talus				
GLl	GLm		Bd	
64.9	61.9		41.4	
68.7	60		43	
64	59.5		41.5	
64.5	59.6		40.8	
67.4	62.9		44.8	
Metatarsal				
GL	Bp	Bd	SD	DD
	46.3	54	25.4	27.8
233	40.4	45.3	23	23.8

Tumulus 4 (*cont.*)

Ph I				
GL	Bp	Bd	SD	
72	30.8	28	27	
69.7	28	27.6	25.5	
SHEEP				
Scapula				
GLP	BG		SLC	
33.8	21.4		20.1	
40.1	26		22	
Talus				
GLl	GLm		Bd	
30	28.3		28.8	
29.6	27.3		19.9	
DONKEY				
Pelvis	Ph I			
LA	GL	Bp	Bd	SD
46.8	67	33.2	31.2	23
Radius				Femur
GL	Bp	Bd	SD	Bp
267	59	50.5	27	83.2
CAMEL				
Scapula				
GLP	BG		SLC	
105	57		72	

TABLE 8.1 Measurements of mammal bones from El-Zuma (*cont.*)
Tumulus 4 (*cont.*)

Humerus	Metacarpal
Bd	Bp
87.8	59

Tumulus 6

DONKEY		
Ph III		
GL	GB	Ld
40.2	45	39.3

Tumulus 7

CATTLE			
Metacarpal	Talus		
Bp	GLl	GLm	Bd
47.2	69.8	63.1	45.2
	57.2	54.5	

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3 State of Preservation

High temperatures during summer, long periods of drought, and sudden and violent floods were the main factors responsible for the poor state of preservation of the bones. These specific conditions of the Sudanese desert made the bones very dry and fragile, almost devoid of organic components. Some of the bones were also weathered, which is a natural consequence of exposure to water followed by high temperatures [Fig. 8.1]. During the excavations, after contact with fresh air, some of the bones crumbled into small pieces, sometimes leaving only bone powder. The long period of storage (from 2007 till 2013) was also detrimental to the bones [Fig. 8.2]. All these factors had an impact on the significant difference between the number of identified bone frag-

ments (NISP) and the minimum number of bone elements (MNE): in some cases fragments that came from one bone were extremely numerous (over 100 fragments per bone). Analysis of the assemblages was, therefore, rather time-consuming, and measurement of the excavated bones was very rarely possible. That is why only 79 cattle and 34 sheep bone elements, such as scapula, pelvis, long bones, and talus were measured. In the case of other animals (donkey, camel, goat, and horse) measurements were taken from 14 bones and fragments of bones. It should also be mentioned that only a few bones were preserved as whole bone elements that enabled all measurements to be taken according to Driesch's (1976) method, and thus made it possible to calculate the withers height of the animals. The author is aware that the coefficients used in this research were originally formulated for European populations of domestic animals and, therefore, the results may be treated only as a suggestion.

It is worth noting that some of the bones bore post-consumption marks as well as marks made by animals. Marks left by animals had a particularly significant impact on the degree of bone fragmentation after carcass parts and meat had been deposited in the graves. Two types of such marks were recorded on the bones from El-Zuma.

The first type, gnawing by rodents, has also been attested at many other sites and is easy to identify. Bones with this type of modification were, however, relatively few. All of these marks were made by rodents of mouse rather than rat size [Fig. 8.3]. Bones of small rodents were present in the tunnels of the biggest tumuli (type I), as were bones bearing marks made by these animals. Only one bone with gnawing marks was found in a type II tumulus (T.26). Such marks were visible on the bones of different animals: cattle, sheep/goat, horse, donkey, camel, and gazelle. They were also recorded on bones from different parts of carcasses. All this suggests that there were no preferences in choosing bones for gnawing. It is possible then that they were used by rodents as a rasp to wear down the incisors that grow throughout the lifetime of these animals, especially given that such marks were also discovered on some pieces of pottery (see Volume II, Chapter 6, p. 160).

The other type of marks of animal origin recorded on the bones from El-Zuma were much more interesting [Fig. 8.4]. Bones with these marks were found in only some of the type I and II tumuli and in one tumulus of type III. Thirteen of the total number of 20 graves analysed between 2013 and 2018 were found to contain bones bearing such marks (T.1, T.4, T.7 and T.8 of type I, T.11, T.12, T.13, T.14, T.15, T.16, T.24, and T.26 of type II, and T.17 of type III). The marks themselves were unusual and had

FIGURE 8.1 State of preservation of animal remains from El-Zuma: a—bone fragmentation, left and right sheep scapulas (right scapula in several pieces bears marks probably left by larvae); b and c—weathered bones

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FIGURE 8.2 State of preservation of the animal remains from the southern part of chamber 2 in T.26 at El-Zuma: a—*in situ*; b—during analysis

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FIGURE 8.3 Rodent gnawing marks on mammal bones found in the tunnels of type I tumuli at El-Zuma
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FIGURE 8.4 Termite gnawing marks visible on bones from tumuli of types I and II at El-Zuma
PHOTOS BY A. KAMROWSKI

FIGURE 8.5 Different types of gnawing marks left by termites on bones from tumuli of types I and II at El-Zuma
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never previously been recorded in this area. In some cases they were separated from each other, while some of them merged into larger patches. The bones, however, were also modified in another way (i.e. they were weathered), which made this pattern not so evident and clear and therefore more difficult to detect. The marks in question were similar at first glance to marks made by certain larvae (Lyman 1994, 394; Huchet et al. 2013), but without the characteristic grooves left by them. They also differed in other details: for instance, they looked as if they were made by gnawing the bone surface starting from the central points and creating a star-shaped pattern [Fig. 8.5]. The small holes visible on the surface of the bones were also unlike the holes left by wasps or wild bees (Pittoni 2009). The closest analogy to these marks seems to be the alteration

of bone surfaces recorded by Backwell et al. (2012, see also references therein) as marks left by the subterranean termite *Trinervitermes trinervoides*. The example shown by Huchet (2014, 340, Fig. 7e) seems to confirm the suggestion connecting these marks with termites. At least four types of patterns correspond to the features described by these authors [see Fig. 8.5]: an etched appearance, surface residue, star-shaped marks and surface pits. Star-shaped marks, which were also observed in the El-Zuma material, are especially characteristic of these insects.

4 Results

4.1 Type 1 Tumuli

Type 1 tumuli were the largest and most complicated structures from an archaeological as well as an archaeozoological point of view, and yielded the richest faunal assemblages from the greatest variety of contexts. The animal bones were located in chambers, grave shafts, tunnels, shafts leading to the tunnels and in robber pits. The remains from two tumuli of this type (T.2 and T.5) were analysed by Osypińska (2005; 2010), and they are not included in this analysis. The contexts in which the animal bones were discovered have already been described in detail in the case of three type 1 graves: T.3, T.4 and T.7 (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21), and so will only be mentioned in passing herein. The animal bones from other graves (T.1, T.6 and T.8) are presented in detail.

4.1.1 Tumulus 1

There were 680 animal bone fragments found in this grave. More than one-third of that number remain unidentified (273 fragments). Most of the remains were discovered in the tunnel, scattered along its entire length. Only 33 fragments from 1 cattle mandible and 17 fragments from 3 cattle teeth that belonged to a very young individual aged about 5–6 months, were found in the robber pit [Table 8.2].

The bone fragments from the tunnel belonged to 3 cattle individuals: one was about 2–2.5 years old, another was about 3.5–5 years old, and the third one was much older—it was more than 5 years old at death. Bones represented only some parts of the carcass: the head, thorax, forelimb, and hind limb without extremities. The bones bore no post-consumption marks but some of them were gnawed by rodents (fragments of mandible and radius) and carnivores (humerus and radius). One of the tooth roots also showed traces of a mild inflammatory process.

Sheep bones were much less numerous: there were only 23 fragments representing 6 bones. All but one belonged to a female aged over 21–24 months. A fragment of mandible belonged to a younger, but not very young, animal of more than 9 months. Only one of the bones bore marks indicative of gnawing by rodents.

Goat was represented solely by 2 horncores from the left and right side of the same skull of an adult female individual. The left one had been chopped about 1 cm above its base. Other ovicaprine remains representing only 4 bones probably belonged to the older sheep mentioned above. They came from the part of the limbs with good-quality meat. The radius featured carnivore gnawing marks. There

were also 7 fragments of 2 teeth that were found at the top of the fill in the western part of the tunnel.

The discovery of bones of transportation animals, such as donkey, horse, and camel, was a great surprise in the light of previous finds that had delivered only cattle and sheep remains. They were few and represented different parts of the carcass. In the case of camel there were only 19 fragments of 5 bones from the head and hind limb of 1 adult female. The calcaneus had been gnawed by rodents. Additionally, one talus was found in the robber pit. This bone could also have come from the individual mentioned above; however, it could be a skeletal element that had got into this assemblage accidentally. The bones of donkey were also few: only 15 fragments from 7 bones of 1 adult animal were found in the tunnel. The bones came from the head and proximal part of a forelimb. The humerus had been gnawed by carnivores. Only 1 fragment of horse pelvis was recorded in the material; it came from 1 adult individual and bore marks of gnawing by rodents.

There was also a group of 20 fragments from 7 equid bones (cranial elements, a fragment of pelvis, and metapodial bones) that could not be identified to species. A small but thickset metacarpal among these bones could probably belong to a mule or a very small horse. This bone was burnt at the distal end. Additionally, a fragment of pelvis had been gnawed by carnivores. The bones from this group probably came from 2 adult animals, but it is not certain if they belonged to the individuals of horse and donkey described above or to another two animals.

Nine fragments of 4 bones of a game animal were noted in the material. All of them belonged to gazelle. This genus was represented by a fragment of mandible, shafts of both tibias, and a metatarsal of an adult animal. The mandible had been gnawed by rodents.

The last group of bones consisted of 3 long bones of a bird.

4.1.2 Tumulus 3

The bone material from this grave has already been described (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21). Animal remains were found in the tunnel and in two partially explored chambers (nos. 1 and 2), though it is possible that some of the material from these chambers had been discarded in the tunnel during looting together with other artefacts of no greater value to the robbers. From the total number of 381 bone fragments, 45 remain unidentified. The zoological and anatomical distribution of the animal remains given in Table 8.3 shows the variety of species found in this grave: bones of animals traditionally used as offerings were found in different contexts, as were porcupine [Fig. 8.6], dog, micro-mammal,

TABLE 8.2 Animal remains discovered in T.1

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel, central part	Thoracic vertebrae	10	1				3 individuals: 1 about 2–2.5 years old; 1 about 3.5–5 years old; 1 more than 5 years old
		Radius	1	1				
		Ulna	1			1		
		Femur	5	1				
		Tibia	3	2			present on 1 fragment	
	Tunnel, eastern part	Thoracic vertebrae	2			2		
		Rib	5	2	1			
		Scapula	5		2			
		Humerus	1	1				
		Radius	1	1				
		Ossa carpi	1			1		
		Metacarpal	3	1				
		Tibia	4			1		
	Tunnel, north-western part, top of fill	Scapula	1	1				
	Tunnel, western part, top of fill	Skull	17		1	1		
		Mandible	16	2				
		Tooth (Skull)	2		1	1		
		Tooth	5	1		≥ 2		
		Scapula	1	1				
		Radius	2	1				
		Ulna	6	1				
		Tibia	8			1		
	Tunnel, western part	Skull	32	1				
		Mandible	8		2			
		Tooth (Skull)	36	3				
		Atlas	1			1		
		Lumbar vertebrae	26			7		
		Humerus	6	1				
		Radius	7	2	1			
		Ulna	1		1			
		Metacarpal	13	1				
		Metacarpal or Metatarsal	1			1		
		Femur	7		1			
		Tibia	8	1		1		
		Metatarsal	8			1		
	Robber pit	Mandible	33		1			1 individual: about 5–6 months old
		Tooth	17		2	1		

TABLE 8.2 Animal remains discovered in T.1 (cont.)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Tunnel, eastern part	Mandible	2	1				2 individuals: 1 more than 9 months (only part of mandible); 1 female, more than 21–24 months
	Tunnel, western part	Skull	1	1				
		Horn core	1	1				
		Metatarsal	1			1		
	Tunnel, western part, top of fill	Mandible	4	1				
		Skull	14			1		
Goat	Tunnel, eastern part	Horn core	1		1			1 individual: female, adult
	Tunnel, western part	Horn core	1	1				
Ovicaprine	Tunnel, eastern part	Pelvis	2	1	1			probably from the older sheep above
		Tibia	1			1		
	Tunnel, western part	Radius	1	1				
	Tunnel, western part, top of fill	Tooth	7			≥ 2		
Horse	Tunnel, western part	Pelvis	1		1			adult
Horse/ Donkey	Tunnel, central part	Mandible	8	1				probably from 2 adult individuals
		Tooth	5			≥ 2		
		Metacarpal	1		1			
		Metacarpal or Metatarsal	2		1			
	Tunnel, eastern part	Pelvis	3	1				
	Tunnel, western part	Pelvis	1	1				
Donkey	Tunnel, western part	Skull	1			1		1 adult individual
		Tooth (Skull)	1		1			
		Tooth (Mandible)	1	1				
		Scapula	2	1				
		Metacarpal	1		1			
	Tunnel, western part, top of fill	Tooth (Skull)	1	1				
	Tunnel, western part	Humerus	8	1				
Camel	Tunnel, western part	Mandible	6	1	1			1 individual: female, adult
		Tooth	11			1		
		Calcaneus	1		1			
	Robber pit	Talus	1	1				probably from the above individual
Gazelle	Tunnel, central part	Metatarsal	3			1		1 adult individual
	Tunnel, eastern part	Tibia	4	1				
	Tunnel, western part	Mandible	1		1			
		Tibia	1		1			

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T.3, tunnel

FIGURE 8.6 Porcupine mandible found in T.3 at El-Zuma
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TABLE 8.3 Animal remains discovered in T.3

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	16			1		1 individual: under 3.5 years old
	Chamber 2	Tooth	18			1		
		Rib	4			3		
		Humerus	6		1			
		Femur	2			1		
		Patella	1			1		
	Niche	Ribs	2			1		2 individuals: 1 under 3.5–4 years old; 1 adult individual
		Humerus	1			1		
	Tunnel	Mandible	16	1				
		Sternum	7			3		
		Rib	31			3		
		Scapula	6			1		
		Humerus	3		1			
		Radius	1		1			
		Ulna	1		1			
		Ossa carpi	1			1		
		Metacarpal	21		1			
		Pelvis	19	1	1			
		Femur	12	1	1			
		Patella	1			1		

TABLE 8.3 Animal remains discovered in T.3 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel	Tibia	1		1			adult individual or individuals
		Centroquartale	2			1		
		Metatarsal	2	1				
	Robber pit	Rib	2			1		
		Scapula	22		1			
		Tibia	2		1			
		Ph III	1		1			
Sheep	Chamber 1	Sternum	29			7		1 individual: about 3.5 years old
		Rib	43			4		
		Scapula	9	1				
		Humerus	11	1				
	Tunnel	Pelvis	2		1			adult individual or individuals
		Femur	5		1			
Ovicaprine	Tunnel	Scapula	2			1		adult individual or individuals
		Humerus	3			1		
	Robber pit	Rib	3			1		
Dog	Robber pit	Humerus	9		1			adult individual or individuals
		Ulna	1		1			
		Femur	1		1			
		Calcaneus	1		1			
		Metatarsal	1		1			
Porcupine	Tunnel	Mandible	7	1				old individual
Micro-mammal	Chamber 1	Femur	1	1				adult individuals
		Tibia	1	1				
	Tunnel	Tibia	2	2				
Bird	Tunnel	Vertebrae	2			2		adult individual: pigeon size
		Coracoid	2			1		

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and bird remains. T.3 was the only type I tumulus analysed during this study that was found to contain animal bone elements in its burial chambers, though these were only partially excavated. Another two tumuli (T.2 and T.5) were analysed by Osypińska (2005; 2010); however, in these the distribution of animal bones differed significantly from that noted in the other tumuli at El-Zuma. The bones from the chambers in T.3 came from cattle and sheep exclusively, while in two papers published by Osypińska, she described camel bones found in the chambers of T.2 and T.5. This identification should be discussed here in

the light of the photographs illustrating these two papers. Osypińska (2005, 407, Fig. 13) presented a cattle pelvis from T.2 bearing marks probably made during dismembering, but she identified it as a camel bone. A similar mistake concerns the material from T.5 (Osypińska 2010, 490, Fig. 3), where a cattle talus with skinning marks on it was described as a camel bone. It is probable that these two errors are simply the editor's mistakes, but as the presence of camel bones amongst food offerings has not been reported from Early Makurian graves, either in El-Zuma, El-Kassinger Bahry (Makowiecki 2007), Tanqasi (Osypińska

T.4, tunnel

FIGURE 8.7 Fragment of skull with horncore of a dorcas gazelle found in T.4 at El-Zuma
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ska 2008) or El-Detti (Iwaszczuk 2016), it is, therefore, also highly improbable in this context. These findings indicate that different sacrificial animals were used during rituals in T.2 and T.5, and therefore that a different group was conducting the sacrifices. Camel has never been mentioned as a sacrificial animal slaughtered for food offerings in Egyptian and Nubian history. The tradition of eating camel meat in Sudan is known nowadays only among nomadic groups in eastern Sudan (Mahmoud El-Tayeb, personal communication). Food offerings consisting of beef, on the other hand, were widespread in ancient Egypt (e.g. Ikram 1995) and have also been attested in Nubia (e.g. Chaix and Grant 1992). All other grave types in El-Zuma analysed during this study contained only sheep or sheep and cattle remains as food offerings deposited in the burial chambers. Misidentification is therefore possible in the case of T.2 and T.5, or at least the presence of camel bones is uncertain in light of the doubts mentioned above.

4.1.3 Tumulus 4

The context of the discovery of 3,551 animal bone fragments inside the tunnel of this tumulus has previously been discussed (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21). It is, however, worth mentioning that the content of the tunnel fill, especially the artefacts and other finds extracted from the dark bottom layer (see Chapter 3.2, Fig. 3.28, this volume) (Mahmoud El-Tayeb 2017, 340–346), were exceptional in the context of the entire cemetery as well as other Early Makurian cemeteries (see Chapter 3, in this volume, and Volume 111). The variety of mammal species found in this grave is also impressive [Table 8.4]. Except for the bones of cattle and sheep (which were the most popular sacrificial animals), elements of the skeletons of transport animals were also found, as well as the remains of a game animal (gazelle) [Fig. 8.7], which shows that the content was very similar to that of T.1. The very characteristic feature exclusive to this tumulus was the presence of almost-complete bat skeletons in the tunnel fill [Fig. 8.8], which will be discussed later.

FIGURE 8.8 Bat head bone elements found in T.4 at El-Zuma: a—dorsal view of a skull, b—ventral view of a skull, c—lateral view of a skull, d—buccal and lingual views of a mandible
PHOTOS BY A. KAMROWSKI

TABLE 8.4 Animal remains discovered in T.4

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Entrance to room W	Thoracic vertebrae	4			1		3 individuals: 1 female, about 3.5–4 years old; 1 male, more than 3–3.5 years old; 1 young individual, between 15 and 20 months old
		Femur	10	1				
		Talus	1		1			
	Tunnel, eastern part	Skull	9			1		
		Mandible	105	1	3			
		Tooth	171		1	≥ 4		
		Cervical vertebrae	1			1		
		Lumbar vertebrae	5			3		
		Rib	45	2				
		Scapula	24	2	1			
		Humerus	16	2	2			
		Radius	18	2	1	1		
		Ulna	3	1	1			
		Metacarpal	11	1	1	1		
		Metacarpal or Metatarsal	1			1		
		Pelvis	4	1	1			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel, eastern part	Femur	13	1		2		
		Patella	1	1				
		Tibia	28	2	3			
		Calcaneus	3	1	2			
		Talus	3	1	2			
		Centroquartale	2			1		
		Ossa tarsi	1			1		
		Metatarsal	9	1		1		
	Tunnel, western part	Skull	89			1		
		Mandible	7	1	1			
		Tooth	63		≥ 4			
		Lumbar vertebrae	1			1		
		Sternum	6			3		
		Rib	56	2	≥ 4			
		Scapula	1			1		
		Humerus	3	1				
		Radius	5	1	1			
		Metacarpal	1	1				
		Metacarpal or Metatarsal	1			1		
		Pelvis	27	1	1			
		Femur	27	3	1			
		Tibia	29	3	2			
		Calcaneus	1		1			
		Talus	2	1	1			
		Ossa tarsi	1			1		
		Metatarsal	36	1	1	2		
		Ph I	3	1	1			
	Tunnel, western part— dark bottom layer	Skull	1			1		
		Mandible	2			1		
		Tooth	5			1		
		Rib	27			2		
		Humerus	4	1				
		Radius	8			1		
		Pelvis	11	1				
		Femur	2		1			
		Tibia	17	1				
		Calcaneus	1	1				
		Talus	4	1	1			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Tunnel, eastern part	Skull	6			1		2 individuals: 1 under 5 months old; 1 between 5 months and 3–3.5 years old
		Mandible	20		1			
		Scapula	1		1			
		Radius	9	1				
		Femur	1		1			
		Talus	1		1			
	Tunnel, western part	Femur	1		1			
		Talus	2	2				
	Tunnel, western part—dark bottom layer	Scapula	9		1			
Goat	Tunnel, western part	Skull	2			1		1 individual: between 2 and 3 years old
		Atlas	1			1		
		Humerus	1	1				
		Calcaneus	1	1				
		Metacarpal or Metatarsal	1			1		
Ovicaprine	Tunnel, eastern part	Skull	22			1		probably from the above sheep and goat
		Tooth (Skull)	4		1			
		Tooth (Mandible)	1		1			
		Tooth	19			≥ 7		
		Sacrum	1			1		
		Rib	9			2		
		Scapula	4	1	1			
		Humerus	3		1			
		Radius	6		1			
		Ossa carpi	4			4		
		Femur	2		1			
		Tibia	7			2	present	
		Calcaneus	1			1		
		Ossa tarsi	1			1		
		Metatarsal	8	1		1	present on 4 fragments	
		Ph I	1	1				
	Entrance to room W	Cervical vertebrae	1			1		
	Tunnel, western part	Skull	5			1		
		Mandible	6		1	1		
		Tooth (Skull)	3			1		
		Tooth (Mandible)	10		1	2		
		Tooth	9			5		

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Tunnel, western part	Cervical vertebrae	1			1		
		Sternum	2			2		
		Rib	55	5	3	2		
		Scapula	6			1		
		Humerus	2	1		1		
		Radius	1		1			
		Metacarpal	1		1			
		Pelvis	2			1		
		Femur	1			1		
		Patella	1		1			
		Tibia	13	1		1		
		Calcaneus	1		1			
		Metatarsal	2			1		
	Tunnel, western part—dark bottom layer	Mandible	4			1		
		Lumbar vertebrae	2			1		
		Metacarpal	1			1		
Donkey	Tunnel, eastern part	Humerus	2	1	1			1 individual: adult
		Metacarpal	2			1		
		Femur	5	1	1			
		Tibia	3		1			
		Ph I	1		1			
	Entrance to room W	Rib	5	1				
		Pelvis	17	1				
	Tunnel, western part	Radius	2		1			
		Ulna	1	1				
		Ossa carpi	1		1			
Camel	Tunnel, eastern part	Skull	8			1		2 individuals: 1 almost adult; 1 adult
		Mandible	3	2	1			
		Thoracic vertebrae	1			1		
		Lumbar vertebrae	1			1		
		Rib	20	3				
		Scapula	2	1	1			
		Humerus	3		1			
		Femur	1	1				
		Metatarsal	4		1			
	Tunnel, western part	Mandible	4			1		
		Scapula	16		1			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Camel	Tunnel, western part	Centroquartale	2	1				
		Calcaneus	1	1				
		Metatarsal	5	1				
Gazelle	Tunnel, eastern part	Humerus	8		1			adult
Dorcas gazelle	Tunnel, western part	Skull	1					female
Carnivore	Tunnel, eastern part	Lumbar vertebrae	1			1		adult
Carnivore	Tunnel, western part	Rib	2			2		1 individual
Dog	Tunnel, eastern part	Lumbar vertebrae	2			1		young
Bat	Tunnel, eastern part, top of fill	Skull	14			5		5 individuals: adult
		Mandible	15	4	3			
		Atlas	2			2		
		Cervical vertebrae	10			10		
		Thoracic vertebrae	2			2		
		Lumbar vertebrae	4			4		
		Rib	28			28		
		Clavicle	1		1			
		Scapula	3	1	2			
		Humerus	6	3	3			
		Radius	3	1	1			
		Ulna	8	3	2	1		
		Metacarpal	1			1		
		Pelvis	3			3		
		Femur	2	1				
		Tibia	3	2	1			
		Metatarsal	2			2		
		Fragments of long bones	15			15		
	Tunnel, eastern part	Skull	2			2		3 individuals: adult
		Mandible	4	2	2			
		Atlas	2			2		
		Axis	2			2		
		Cervical vertebrae	8			8		
		Thoracic vertebrae	4			4		
		Lumbar vertebrae	4			4		
		Sternum	2			2		
		Clavicle	1			1		
		Rib	26			26		
		Scapula	4	2	2			
		Humerus	4	2	2			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Bat	Tunnel, eastern part	Radius	2			1		
		Ulna	6	2	3			
		Metacarpal	10			8		
		Pelvis	2	1	1			
		Femur	5	2	2			
		Metatarsal	1			1		
		Ph I	1			1		
		Fragments of long bones	10			10		
	Tunnel, western part, top of fill	Skull	4			1		1 individual: adult
		Mandible	4	1	1			
		Cervical vertebrae	4			4		
		Thoracic vertebrae	3			3		
		Sacrum	1			1		
		Sternum	1			1		
		Rib	12			12		
		Scapula	4	1	1			
		Humerus	2	1	1			
		Ulna	3	1	1			
		Metacarpal	2			2		
		Pelvis	2			1		
		Tibia	2	1	1			
		Ph I	1			1		
		Fragments of long bones	27			27		
	Tunnel, western part	Skull	2			1		2 individuals: adult
		Mandible	1		1			
		Humerus	3	1	2			
		Ulna	3	1	1			

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4.1.4 Tumulus 6

A total of 176 remains were discovered in this tumulus. Only 16 fragments remain unidentified. The bones were found within two structures: the shaft and the tunnel, but the remains from the tunnel were much more numerous than those from the shaft [Table 8.5]. There were only 4 ovicaprine remains (from the thorax and the proximal parts of the limbs) in the shaft. The bone material from the tunnel was similar in species variety to that noted in T.3. Remains of cattle, ovicaprine, donkey, small rodents, and a bird of pigeon size were discovered in the tun-

nel. The cattle, ovicaprine, and donkey bones came from adult individuals. Cattle remains were represented almost exclusively by cranial elements (only 2 other bones were recorded there: a carpal and tibia). Donkey and ovicaprine remains were very scarce. The first of these species was represented solely by a third phalanx, and the second by a solitary fragment of femur. The tunnel must have been open for some time (after the funeral? after the robbery?) because in both corridors of the tunnel, and at the front of that structure, there were incomplete skeletons of small rodents. The bones of one of them could be identified

TABLE 8.5 Animal remains discovered in T.6

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel, central part	Mandible	18	1				probably 1 individual: adult
	Tunnel, north-eastern part	Mandible	3			1		
	Tunnel, north-western part	Ossa carpi	1			1		
	Tunnel, southern part	Tooth	2		1			
		Mandible	10		1			
	Tunnel, western part	Tibia	1			1		
Ovicaprine	Shaft	Rib	1					1 individual between 5 months and 3.5 years old
		Scapula	3	1		1		
		Tibia	1					
	Tunnel, north-western part	Femur	1					
Donkey	Tunnel, central part	Ph III	1	1				probably adult
<i>Arvicanthis niloticus</i>	Tunnel, western part	Skull	1			1		1 adult individual
		Mandible	2	1	1			
		Vertebrae	3			3		
		Long bones	10			9		
Small rodent	Tunnel, south-eastern part	skeletons of 2 young individuals, almost complete—one individual of bigger size						
Micro-mammal	Tunnel, eastern part	Mandible	1					2 individuals: 1 young, 1 adult
		Pelvis	1					
		Femur	2	1	1			
		Tibia	2	1	1			
Bird	Tunnel, eastern part	Vertebrae	16					young individual: pigeon size
		Sternum	2					
		Long bones	38					

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to species as *Arvicanthis niloticus*; the two others (almost complete) were not determined.

4.1.5 Tumulus 7

The content of T.7 was very typical of type I tumuli. All of the remains, 329 fragments, were found in the tunnel. The faunal material has already been analysed (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21), and it seems that the zoological and anatomical distribution of the remains [Table 8.6] is very similar to the distribution of the remains recovered from T.1, T.3, T.6, and T.8. Some of the cattle bones bore evidence of filleting (ribs) [Fig. 8.9].

4.1.6 Tumulus 8

There were 388 fragments of animal bones found in T.8; unfortunately, 88 of that number could not be identified. The remains were discovered in chamber 1, in the tunnel and in the robber pit. Chamber 1 yielded the bones of two cattle individuals (one aged about 2–2.5 years and the other an adult), as well as two sheep individuals (one aged 2–2.5 years and the other an adult). The withers height of the cattle was estimated at 111 cm and the sheep withers height at 53.5 cm. The remains of both species came from the thorax and proximal parts of limbs. Also some cattle and sheep bones from the same parts of the carcasses were found in the tunnel. They probably came from the same animals as the bones deposited in chamber 1. Additionally, the head bones and a large part of the thorax of an ovicaprine found in the tunnel belonged to an indi-

TABLE 8.6 Animal remains discovered in T.7

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	1			1		
	Chamber 1, group 1	Rib	4			4		
		Scapula	30		1			
		Humerus	4			1		
		Radius	2		1			
		Ulna	2		1			
		Ossa carpi	1			1		
		Femur	9		1			
	Chamber 1, eastern part	Sternum	3			3		
		Scapula	3	1			present	
		Patella	1			1		
	Chamber 2, group 1	Femur	20	1				
		Patella	1	1				
	Chamber 2, group 2, in vessel Z11/19 and around	Pelvis	6		1			
	Chamber 2, group 3	Humerus	9		1			
	Chamber 2, group 4	Thoracic vertebrae	6			4		2 individuals: 1 between 7–10 and 15–20 months old; 1 between 7–10 months and 3.5–4 years old
		Lumbar vertebrae	15			6		
		Sternum	4			4		
		Rib	116			≥ 7	present on 2 fragments	
		Scapula	24	1	1			
		Humerus	9	2				
		Radius	16	2				
		Ulna	4	1	1			
		Ossa carpi	6	1	5			
		Pelvis	7	1	1			
		Femur	3			1?		
		Tibia	25	1	2			
		Talus	2	1	1			
	Chamber 2	Thoracic vertebrae	2			2		
		Lumbar vertebrae	4			≥ 2		
		Sternum	1			1		
		Rib	51			≥ 2		
		Scapula	3			1		
		Ulna	1			1		
		Femur	3	1				
	Shaft, bottom, eastern part	Mandible	1		1			adult individual or individuals
	Shaft, bottom	Rib	1			1		

TABLE 8.6 Animal remains discovered in T.7 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Chamber 1	Radius	1		1			2 individuals: 1 under 3–4 months old; 1 adult
		Calcaneus	1		1			
	Chamber 1, eastern part	Scapula	4	1				
		Radius	1	1				
		Femur	8	1				
	Chamber 1, group 1	Humerus	2		1			
	Chamber 2, group 3	Calcaneus	1	1				
	Chamber 2, group 4	Humerus	2	2				
		Radius	2	1	1			
		Pelvis	1	1				
	Chamber 2, in vessel 14	Pelvis	5	1				
	Chamber 2	Talus	1	1				
		Tibia	1	1				
Ovicaprine	Chamber 1	Femur	1			1		2 individuals: 1 between 5 months and 3.5 years old; 1 under 15–20 months, probably remains from the young sheep above
	Chamber 1, eastern part	Cervical vertebrae	2			1		
		Lumbar vertebrae	2			1		
		Sternum	1			1		
		Humerus	1			1		
		Ulna	1			1		
		Metacarpal	2			2?		
		Ossa carpi	1			1		
		Femur	5			1?		
		Tibia	1		1			
		Calcaneus	1			1		
	Chamber 1, group 1	Sternum	1			1		
		Radius	1		1			
		Femur	8		1			
		Tibia	2		1			
	Chamber 2, group 3	Rib	2			1		
		Pelvis	1			1		
	Chamber 2, group 4	Cervical vertebrae	1			1		
		Thoracic vertebrae	3			3		
		Lumbar vertebrae	4			1		
		Rib	26			1?		
		Radius	1			1		
		Ulna	2	1				
		Ossa carpi	2	2				
		Pelvis	3	1	1			

TABLE 8.6 Animal remains discovered in T.7 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprines	Chamber 2, group 4	Tibia	6			1?		
		Ossa tarsi	1	1				
	Chamber 2	Rib	25			1		
		Humerus	4			1		
		Radius	1			1		
		Femur	3			1?		
		Tibia	5	1				
		Ossa tarsi	1			1		
	Shaft, bottom	Rib	14			≥ 3		adult individual or individuals
		Humerus	3			1		

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vidual or individuals under 3–3.5 years old. Two fragments of goat ulna were deposited in the tunnel. Goat bones have rarely been discovered in the El-Zuma graves and might be regarded as an intrusive deposit. Some bones of adult sheep, ovicaprine, and birds of pigeon size were also recovered from the robber pit [Table 8.7]. It seems that they were not connected with the funerary rituals as they were found in the mixed earth and gravel of the robber pit.

4.2 Type II Tumuli

The discovery context of the animal bones in type II tumuli has already been discussed in the case of some tumuli (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 21–23; Iwaszczuk 2015, 427–428). Two other tumuli of this type, T.10 and T.25, were analysed by Osypińska (2010), as mentioned earlier.

4.2.1 Tumulus 9

The majority of animal remains were discovered in the central and southern part of chamber 1, though some remains were also excavated in the robber pit [Table 8.8]. Bones found in the chamber had been moved from their original positions and mixed with human remains. All of these bones (36 fragments in total) could be identified. The material consisted of ovicaprine remains exclusively. Only 15 fragments from 5 bones were found in the chamber. They represented parts of the carcass with good-quality meat: the thorax and proximal parts of the limbs of a relatively young animal. None of the bones bore post-consumption or other marks. Additionally, 21 fragments of two ovicaprine bones (a mandible and tooth) were discovered in the robber pit, which suggests that they

were probably not connected with the funerary ritual and undoubtedly got there after the superstructure had been built above the grave.

4.2.2 Tumulus 11

Animal bones were concentrated in one group in chamber 1 and in four clusters in chamber 2, but some bones were also found in other parts of these chambers. A small number of the remains, only 19 fragments, were also found at the bottom of the shaft [Table 8.9]. Altogether, 1,362 bone and tooth fragments were analysed; unfortunately, a large number of them (794 fragments) could not be identified to species because they lacked diagnostic features.

The remains discovered in the chambers came from 2 individuals: one was aged between 7–10 and 15–20 months, the other one was a little older (it was only possible to estimate the age to within a broad range of between 7–10 months and 3.5–4 years). Sheep bones also came from 2 individuals: the first one was very young, less than 3–4 months old, and the other was an adult. Other remains of ovicaprine belonged to 2 individuals: one of them was under 15–20 months (it is probable that these remains came from the young sheep mentioned above); the other one was older—between 5 months and 3.5 years old. All remains found in the shaft belonged to adult animals.

Cattle and ovicaprine remains were located in a cluster in the western part of chamber 1. Cattle bones were more numerous: there were 52 fragments from 10 bones of the thorax and proximal parts of the limbs. In this group there were also ovicaprine remains representing the same body parts as the cattle remains. One of these bones

TABLE 8.7 Animal remains discovered in T.8

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Ribs	15			3		2 individuals: 1 about 2–2.5 years old, 1 adult
		Scapula	9		1			
		Femur	4		1	1		
		Patella	1		1			
		Tibia	12		1			
	Tunnel	Cervical vertebrae	3			3		
		Ribs	6			3		
		Scapula	111	1				
		Humerus	8	1	1			
		Radius	12		1			
		Ossa carpi	4			4		
		Femur	1	1				
		Tibia	1			1		
		Talus	1		1			
		Ph 1	1			1		
Sheep	Chamber 1	Thoracic vertebrae	3			1		2 individuals: 1 individual between 15–20 months and 3.5 years old, 1 adult individual
		Ribs	1			1		
		Humerus	9	1				
		Radius	2	1				
		Femur	11	1				
	Tunnel	Tibia	3		1			1 individual under 3–3.5 years old
		Scapula		2				
		Humerus	4	1				
		Radius	3	2				
	Robber pit	Ulna	1	1				adult individual
Goat	Tunnel	Calcaneus	1	1				adult individual
Ovicaprine	Tunnel	Ulna	2	1				2 individual: 1 under 3–3.5 years old, 1 adult (only 2 lumbar vertebrae)
		Skull	1			1		
		Mandible	3			1		
		Cervical vertebrae	3			3		
		Thoracic vertebrae	2			1		
		Lumbar vertebrae	8			2		
		Ribs	5			2		
		Scapula	5	1				
		Radius	2			1		
		Metacarpals or Metatarsals	2			1		
		Pelvis	2		1			
		Femur	10	1				
		Tibia	9	1				

TABLE 8.7 Animal remains discovered in T.8 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Robber pit	Lumbar vertebrae	1			1		adult individual
		Scapula	2			1 (part)		
		Radius	5		1			
		Metacarpals or Metatarsals	6			1 (part)		
		Pelvis	1		1			
		Femur	2		1			
Bird	Tunnel	Long bones	1			1		adult individual or individuals, pigeon size
	Robber pit	Long bones	1					

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TABLE 8.8 Animal remains discovered in T.9

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 1, southern and central part (among human bones)	Rib	7	1	1			1 individual, relatively young
		Humerus	1			1		
		Pelvis	2	1				
		Femur	5		1			
	Robber pit, south-eastern part	Mandible	13			1		1 individual
		Tooth	8			1		

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(a humerus) could be determined to species (sheep). The other bones of cattle (8 fragments from 6 bones) and ovicaprine (33 fragments from 16 bones) were found dispersed, mostly at the eastern side of the chamber, and they represented the same carcass parts as the bones mentioned above. The only ovicaprine remains determined to species belonged to sheep.

In chamber 2 animal remains were distributed in four clusters (see Chapter 3.3, Fig. 3.103, this volume). The first two groups comprised only cattle bones. Group 1, located in the southern part of the chamber near bottle Z11/26, consisted of an articulated femur and patella. Group 2, found in and around a cup that was slipped and burnished on both sides (Z11/19), also in the southern part of the chamber, was made up of fragments of pelvis broken into pieces. Two other groups, located in the central (group 3) and northern (group 4) parts of the chamber, were more numerous (especially group 4) and contained not only cattle bones but also ovicaprine remains. There were 4 bones in group 3, including a cattle humerus and 3

ovicaprine bones, among them a sheep calcaneus. Two incomplete skeletons of cattle and sheep made up group 4; however, the bones were partially mixed. Both of them lacked cranial elements and extremities. Bones of cattle and ovicaprine were also scattered in the space between the clusters; some of them could have belonged to the abovementioned skeletons, and the rest came from other individuals.

Additionally, a fragment of cattle mandible and rib, as well as fragments of 4 ovicaprine bones from the thorax and proximal part of a forelimb, were found in the eastern part of the shaft.

Some of the bones bore post-consumption marks, such as chopping and filleting. Filleting marks were observed on cattle bones (lumbar and thoracic vertebrae, ribs, scapula, pelvis) as well as ovicaprine bones (thoracic vertebra). Chopping marks were also recorded on both cattle (scapula, ulna, pelvis) and ovicaprine bones (thoracic vertebra and pelvis). A few bones also bore marks indicating dismembering. In T.11 there were 3 such bones belonging to

TABLE 8.9 Animal remains discovered in T.11

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	1			1		
	Chamber 1, group 1	Rib	4			4		
		Scapula	30		1			
		Humerus	4			1		
		Radius	2		1			
		Ulna	2		1			
		Ossa carpi	1			1		
		Femur	9		1			
	Chamber 1, eastern part	Sternum	3			3		
		Scapula	3	1			present	
		Patella	1			1		
	Chamber 2, group 1	Femur	20	1				
		Patella	1	1				
	Chamber 2, group 2, in vessel 17 and around	Pelvis	6		1			
	Chamber 2, group 3	Humerus	9		1			
	Chamber 2, group 4	Thoracic vertebrae	6			4		2 individuals: 1 between 7–10 and 15–20 months old; 1 between 7–10 months and 3.5–4 years old
		Lumbar vertebrae	15			6		
		Sternum	4			4		
		Rib	116			≥ 7	present on 2 fragments	
		Scapula	24	1	1			
		Humerus	9	2				
		Radius	16	2				
		Ulna	4	1	1			
		Ossa carpi	6	1	5			
		Pelvis	7	1	1			
		Femur	3			1?		
		Tibia	25	1	2			
		Talus	2	1	1			
	Chamber 2	Thoracic vertebrae	2			2		
		Lumbar vertebrae	4			≥ 2		
		Sternum	1			1		
		Rib	51			≥ 2		
		Scapula	3			1		
		Ulna	1			1		
		Femur	3	1				
	Shaft, bottom, eastern part	Mandible	1		1			adult individual or individuals
	Shaft, bottom	Rib	1			1		

TABLE 8.9 Animal remains discovered in T.11 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Chamber 1	Radius	1		1			2 individuals: 1 under 3–4 months old; 1 adult
		Calcaneus	1		1			
	Chamber 1, eastern part	Scapula	4	1				
		Radius	1	1				
		Femur	8	1				
	Chamber 1, group 1	Humerus	2		1			
	Chamber 2, group 3	Calcaneus	1	1				
	Chamber 2, group 4	Humerus	2	2				
		Radius	2	1	1			
		Pelvis	1	1				
	Chamber 2, in vessel 14	Pelvis	5	1				
	Chamber 2	Talus	1	1				
		Tibia	1	1				
Ovicaprine	Chamber 1	Femur	1			1		2 individuals: 1 between 5 months and 3.5 years old; 1 under 15–20 months, probably remains from the young sheep above
	Chamber 1, eastern part	Cervical vertebrae	2			1		
		Lumbar vertebrae	2			1		
		Sternum	1			1		
		Humerus	1			1		
		Ulna	1			1		
		Metacarpal	2			2?		
		Ossa carpi	1			1		
		Femur	5			1?		
		Tibia	1		1			
		Calcaneus	1			1		
	Chamber 1, group 1	Sternum	1			1		
		Radius	1		1			
		Femur	8		1			
		Tibia	2		1			
	Chamber 2, group 3	Rib	2			1		
		Pelvis	1			1		
	Chamber 2, group 4	Cervical vertebrae	1			1		
		Thoracic vertebrae	3			3		
		Lumbar vertebrae	4			1		
		Rib	26			1?		
		Radius	1			1		
		Ulna	2	1				
		Ossa carpi	2	2				
		Pelvis	3	1	1			

TABLE 8.9 Animal remains discovered in T.11 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 2, group 4	Tibia	6			1?		
		Ossa tarsi	1	1				
	Chamber 2	Rib	25			1		
		Humerus	4			1		
		Radius	1			1		
		Femur	3			1?		
		Tibia	5	1				
		Ossa tarsi	1			1		
	Shaft, bottom	Rib	14			≥ 3		adult individual or individuals
		Humerus	3			1		

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cattle: a pelvis with cut marks visible on the acetabulum, a mandible with cut marks between the processes, and a talus with a cut mark recorded on the distal end. There were also 2 ovicaprine bones with such marks: a humerus with a cut mark visible near the trochlea, and a sheep radius with a cut mark on the proximal end. Additionally, a cattle talus bore marks of skinning on the medial surface.

4.2.3 Tumulus 12

2,451 animal bones and bone fragments were found in two chambers and in the shaft; 925 of them remain unidentified. It seems that most of the remains from the shaft were originally deposited in chamber 1. Some of them might have got there together with the shaft fill during the funeral or as a result of robber activity. The bones came from two cattle individuals and at least two sheep [Table 8.10]. The cattle remains belonged to two animals between 12–15 months and 3.5–4 years old, while the sheep bones came from one individual aged about 3.5 years and one individual between 5 and 15–20 months old. The bones found in the shaft belonged to young animals, probably from the carcasses deposited in the chambers. It was possible to establish sheep withers height on the basis of three bones from one animal. The results were between 65.8 cm and 73.3 cm with an average of 68.8 cm. In chamber 2 one cattle rib and a few sheep bones (ribs and sternum, a fragment of the proximal part of the right and left forelimbs and two bones from the proximal part of a hind limb) were found. Many more bones were discovered in chamber 3. There were at least five cuts of beef there: part of the thorax, the right and left forelimbs

without extremities, and the right and left parts of the hind limbs, also without extremities. The sheep remains were represented by ribs, bones from the proximal part of the left forelimb, and a big part of the left hind limb without extremities. Additionally, four beef cuts were deposited in a large and shallow bowl, slipped on the inside (Z12/125): ribs, bones from the proximal part of the left forelimb and the distal part of the right forelimb, and probably the proximal part of a hind limb. Bones were also located in four clusters in the northern, southern, south-eastern, and western parts of the shaft (see Chapter 3.3, Fig. 3.44a, in this volume). They consisted of ribs and the proximal parts of the limbs of cattle, and of fragments from the thorax and limbs (mostly the proximal parts) of two young sheep individuals.

Some of the cattle and ovicaprine bones bore evidence of chopping, cutting (ribs, humerus, and radius) and filleting (vertebrae, ribs, and radius) [Fig. 8.9].

4.2.4 Tumulus 13

Animal remains were found in almost all of the structures of this grave. As the ceiling of chamber 1 collapsed and excavation was, therefore, impossible (see Chapter 3.3, Fig. 3.53, this volume), only those bones found among the bricks of the blocking wall that fell into the shaft were analysed. These bones were mixed with human remains and other artefacts, such as faience beads, arrowheads, and pottery, and they had probably been thrown out of the chamber during looting. The total number of animal remains was 558 fragments, only 96 of which could not be identified. Bone fragments came from three young individuals of cattle: two of them were about 7–10 months

FIGURE 8.9 Cutting and chopping marks visible on cattle bones from El-Zuma: a—chopping marks on a humerus (this bone is also weathered); b—chopping marks on a femur; c—filleting marks on a rib; d–e—filleting marks on ribs; f—chopping and cut marks on a humerus

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old (only 2 bone fragments of the second animal were found in the grave) and one was about 15–20 months old. Ovicaprine remains were less numerous and the majority of them belonged to 1 sheep aged about 5 months. A further 2 fragments of ribs found in chamber 3 in a bowl with grooved decoration, slipped and polished on both surfaces (Z13/27), came from an adult animal. In the extension of the robber pit, on its northern side, there was also a fragment of goat skull and 1 bivalve shell broken into pieces. It is highly improbable that they were connected with funerary rituals [Table 8.11].

The remains from the shaft, which consisted exclusively of cattle and ovicaprine bones, were characteristic of almost all other chambers in tumuli of type II. Cattle was represented by 90 fragments from 11 bones of the thorax and proximal parts of the limbs. Ovicaprine remains were represented by 71 fragments from 9 bones, among them 7 fragments from 3 sheep bones, all of which came from the same body parts as the cattle remains. The content of additional chambers was very similar: only cattle and ovicaprine bones from the same parts of the carcass were recorded in chambers 2, 3 and 5. Additionally,

TABLE 8.10 Animal remains discovered in T.12

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 2	Ribs	25			1	present on 2 fragments	2 individuals between 12–15 months and 3.5–4 years old
	Chamber 3	Sternum	3			1		
		Ribs	157	1		5	present on 39 fragments	
		Scapula	44	1	1		present on 4 fragments	
		Humerus	8		1			
		Radius	12	1	1		present	
		Ulna	5			2	present on 1 fragment	
		Ossa carpi	2			2		
		Femur	32	2	2		present on 3 fragments	
		Tibia	15	1	1			
		Talus	2	1	1			
		Ossa tarsi	1			1		
	Chamber 3, in vessel Z12/125	Ribs	35			2	present on 6 fragments	
		Scapula	23	1			present on 8 fragments	
		Humerus	5		2			
		Radius	10		2		present on 1 fragment	
		Ulna	1		1			
		Ossa carpi	6		6			
		Pelvis	2			1		
		Femur	17	1				
		Patella	1	1				
	Shaft	Scapula	5	1				
		Tibia	28			1		
	Shaft, northern part	Ribs	61			1		
		Femur	27		1			
	Shaft, southern part	Ribs	102			4	present on 9 fragments	
		Scapula	67	2				
		Humerus	25		1		present	
		Radius	20	1			present on 2 fragments	
		Ulna	4			1		
		Ossa carpi	5			5		
		Pelvis	15	1				
		Femur	27	1		1		
		Tibia	6			1	present on 2 fragments	
	Shaft, south-eastern part	Ribs	48			2	present	
		Scapula	54	1	1		present on 8 fragments	
		Humerus	14	1			present	
		Radius	5	1			present	

TABLE 8.10 Animal remains discovered in T.12 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Shaft, south-eastern part	Ulna	2			1		
		Ossa carpi	4			4		
		Pelvis	8		1			
		Femur	16	1	1		present on 1 fragment	
	Shaft, western part	Ribs	40			1		
Sheep	Chamber 2	Sternum	5			5		
		Ribs	58			2	present on 6 fragments	
		Scapula	10		1			
		Humerus	11		1		present	
		Radius	2	1			present	
		Ulna	2	1				
		Ossa carpi	3			3		
		Pelvis	5		1			
		Femur	5	1			present	
	Chamber 3	Ribs	39	1		2	present on 2 fragments	
		Scapula	10		1			
		Humerus	3		1			
		Pelvis	7		1			
		Femur	2	1				
		Patella	1			1		
		Tibia	7	1	1			
		Calcaneus	2	1	1			
		Talus	1	1				
	Shaft, southern part	Atlas	2			1		
		Axis	1			1		
		Cervical vertebrae	24			5		
		Thoracic vertebrae	39			8		
		Lumbar vertebrae	42			6		
		Sacrum	4			1		
		Ribs	32			3		
		Scapula	48	1				
		Humerus	7	1				
		Radius	3		1			
		Ulna	6		1			
		Ossa carpi	3			3		
	Shaft, south-eastern part	Atlas	1			1		
		Axis	1			1		
		Cervical vertebrae	15			5		

2 individuals: 1 about 3.5 years old, 1 between 5 and 15–20 months old

young individual

young individual

TABLE 8.10 Animal remains discovered in T.12 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Shaft, south-eastern part	Thoracic vertebrae	22			6		
		Lumbar vertebrae	29			6		
		Sacrum	3			1		
		Ribs	21			2		
		Scapula	7		1			
		Humerus	3		1			
		Radius	3		1		present	
		Ulna	5		1			
		Ossa carpi	3			3		
Ovicaprine	Shaft, western part	Lumbar vertebrae	17			4		young individual or individuals
		Ribs	2			1		
		Femur	11			1		

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FIGURE 8.10 Dismemberment marks visible on cattle bones from El-Zuma: a—femur; b—humerus; c—talus

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one ovicaprine rib was found in bowl Z13/27. There were also fragments of 2 ovicaprine ribs in a bowl slipped and burnished on both sides (Z13/11), located in the western part of chamber 5.

Some of the cattle and ovicaprine bones bore post-consumption marks as well as marks made during dismembering. The bones showed traces of cutting (a rib, scapula, pelvis, and 2 femurs) and filleting (3 ribs, a scapula, pelvis, and femur). Evidence of dismembering was vis-

ible on 2 bones: a pelvis with a cut mark on the sacral tuber, and a humerus with 2 parallel cut marks on the trochlea and a cut mark on the shaft near the distal end [Figs. 8.9, 8.10, 8.11].

TABLE 8.11 Animal remains discovered in T.13

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Shaft, among human bones	Lumbar vertebrae	1			1		3 individuals: 1 about 7–10 months old, 1 about 15–20 months old, 1 about 7–10 months (only 2 bones)
		Rib	41			≥ 2	present on 4 fragments	
		Scapula	1		1			
		Humerus	3		1		present	
		Ossa carpi	1		1			
		Pelvis	12	1				
		Femur	19	1			present	
		Patella	1	1				
		Tibia	10	1				
		Talus	1	1				
	Chamber 2	Rib	15			1	present on 4 fragments	
		Pelvis	17	2				
		Femur	6	1				
	Chamber 3	Thoracic vertebrae	3			1		
		Rib	30		≥ 4			
		Scapula	116	2	1			
		Humerus	24		1			
	Chamber 5, group 1	Rib	5			2		
		Pelvis	3		1			
Sheep	Shaft, among human bones	Tibia	5	1				1 individual about 5 months old
		Calcaneus	1	1				
		Talus	1	1				
	Chamber 3	Pelvis	2		1			
		Femur	13		1			
		Patella	1		1			
		Tibia	3		1			
		Calcaneus	1		1			
		Talus	1		1			
		Sesamoid	1			1		
Goat	Extension of the robber pit on the northern side	Skull	1			1		1 individual
Ovicaprine	Shaft, among human bones	Rib	44			1?	present	most of the bones from the above sheep; additionally, 2 fragments of rib from an adult individual
		Humerus	1			1		
		Femur	16	1			present	
		Patella	1	1				
		Metatarsal	1			1		
		Sesamoid	1			1		
	Chamber 2	Rib	13			1	present	

TABLE 8.11 Animal remains discovered in T.13 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 3	Rib	30	7	5			See above
	Chamber 5, group 2, in vessel Z13/11	Rib	10		1	1		
	Chamber 3, in vessel Z13/27	Rib	1			1		

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4.2.5 Tumulus 14

The 538 animal bone fragments from this tumulus and the context of their discovery have already been described (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 22–23). They were found exclusively in the burial chambers and two additional chambers [Table 8.12]. The content of this grave was very typical of type II tumuli and similar to that of all other graves of this type but one (T.9) at the El-Zuma cemetery.

4.2.6 Tumulus 15

The animal remains from this tumulus have been partially discussed before (Iwaszczuk 2015); however, after publishing the material some new remains from this grave were analysed, which is why it was important to revise the earlier results. T.15 was the best equipped type II tumulus, though the state of preservation of the faunal material was very poor and resulted in a great number of unidentified small bone fragments: 925 elements out of 1,921 remain undetermined.

Chamber 1 contained pottery and a few fragments of nails and bed frame fittings together with human and animal remains. Pottery (in two clusters) (see Chapter 3.3, Fig. 3.65a, this volume) and animal bones (in one cluster in the central part of the chamber) were also discovered in chamber 2, though mostly animal remains and some botanical remains were excavated in this part of the grave.

Cattle remains (779 fragments from 35 bones) were deposited in the burial chamber (Ch. 1) and in one of the additional chambers (Ch. 2) [Table 8.13]. Some of the cattle bones were also found in the shaft, in the vicinity of chamber 1, and might have originally come from the burial chamber. It is interesting that 5 cattle ribs together with 3 ovicaprine ribs were found in a bowl in the northern part of chamber 2. The remains located in the chambers and shaft came from the thorax (cervical vertebrae and ribs) and proximal parts of forelimbs (scapula and humerus) and hind limbs (pelvis, femur, patella, and tibia) with the addition of one left and two right taluses. Cattle bones from this grave belonged to three individuals: one about

2–2.5 years old, one aged between 2–2.5 and 3.5–4 years and the last one over 3.5–4 years.

Ovicaprine bones were less frequent than cattle remains [see Table 8.13]. Only 26 fragments from 5 bones belonged to sheep, while another 191 fragments from 19 bones could not be identified to species. Sheep bones (a pelvis and femur) were deposited *in situ* in chambers 1 and 3. Three other bones (3 humeri and 1 femur) were probably thrown out of chamber 1 and were found in the shaft near this chamber. The remains belonged to 2 individuals: one under 3.5 years old and one about 3–3.5 years old. Ovicaprine bones were also deposited in chambers 2 and 3. In chamber 2 there were only three ribs inside a bowl slipped and burnished on both sides (Z15/35), while in chamber 3 the bones were found on the floor. The other bones were recovered from the shaft in the vicinity of chamber 1. Altogether, 165 fragments from 16 bones were found in these contexts. They came from the thorax (ribs, lumbar vertebra, and sacrum) and proximal parts of the forelimb (humerus) and hind limb (femur and tibia) and probably belonged to the 2 sheep mentioned above. There were also 26 fragments from 3 bones (mandible, rib, and femur) discovered in the fill of the shaft that came from a different individual or individuals.

It seems that the animal offerings deposited in T.14 and T.15 were typical of this type of grave. Similar animal remains that came only from cattle and ovicaprines (most probably sheep only, as the goat remains were not found in sepulchral contexts) are known from other type II tumuli in El-Zuma, such as T.11, T.12, T.13, T.16, T.24, and T.26. Only T.9 had a different bone assemblage, yielding only a few ovicaprine bones during excavation; however, this grave had been damaged by the collapse of the chambers' ceilings, and the fill of the chambers was very wet, which might have caused the destruction of the botanical and zoological remains.

TABLE 8.12 Animal remains discovered in T.14

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Cervical vertebrae	1			1		2 individuals: 1 between 2–2.5 and 3.5–4 years old, 1 between 3.5–4 and 5 years old
		Thoracic vertebrae	1			1		
		Sternum	1			1		
		Rib	43	1	1	1	present on 1 fragment	
		Scapula	1	1				
		Femur	16		1			
		Patella	1			1		
	Chamber 2	Rib	20			≥ 4	present on 3 fragments	
		Humerus	6	1				
	Chamber 3	Sternum	6			3		
		Rib	94	1		≥ 6	present on 2 fragments	
		Scapula	78		1			
		Humerus	6	1				
		Tibia	2	1				
		Talus	1	1				
		Ossa tarsi	1			1		
Sheep	Chamber 2	Humerus	5		1			2 individuals: 1 under 3.5 years old, 1 about 3.5 years old
		Radius	1		1			
		Ulna	3		1			
		Tibia	17	1	1			
		Calcaneus	3		2			
		Talus	2	1	1			
Ovicaprines	Chamber 1	Humerus	1			1	present	probably from 2 of the above sheep
		Tibia	2			1		
	Chamber 2	Rib	13			≥ 2		
		Scapula	3			1		
		Ossa carpi	1			1		
		Pelvis	6	1				
		Ossa tarsi	1			1		
		Centroquartale	1	1				
	Chamber 3	Rib	110	1	1	≥ 6		
		Sternum	11			≥ 2		
		Pelvis	5	1				
		Femur	6	1	1			
		Patella	1			1		

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TABLE 8.13 Animal remains discovered in T.15

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	37		1	2		3 individuals: 1 about 2–2.5 years old, 1 between 2–2.5 and 3.5–4 years old, 1 more than 3.5–4 years old
		Tibia	8	1		1		
		Talus	1			1		
	Chamber 2	Scapula	181		1			
		Humerus	53	1			present	
	Chamber 2, in vessel Z15/39	Rib	138	2		3	present on 23 fragments	
	Shaft (in the vicinity of chamber 1)	Rib	218			6	present on 15 fragments	
		Cervical vertebrae	1			1		
		Pelvis	25		1	1		
		Femur	70	3	2			
		Patella	1	1				
		Tibia	43	2	2			
		Talus	3	2	1			
Sheep	Chamber 1	Femur	13	1				2 individuals: 1 under 3.5 years old, 1 about 3–3.5 years old
	Chamber 3	Pelvis	9	1				
	Shaft (in the vicinity of chamber 1)	Humerus	3	1		1		
		Femur	1			1		
Sheep/goat	Chamber 2, in vessel Z15/39	Rib	14	2		1		probably from 2 of the above sheep
	Chamber 3	Lumbar vertebrae	9			≥ 2		
		Sacrum	1			1		
		Rib	23			≥ 3		
	Shaft (in the vicinity of chamber 1)	Rib	75			2		
		Humerus	3			1		
		Femur	24	1	1			
		Tibia	16		1	1		
	Shaft	Mandible	15			1		probably not from the 2 sheep above
		Rib	5			1		
		Femur	6			1		

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4.2.7 Tumulus 16

Animal remains were discovered in 2 clusters: in the northern part of chamber 1 (group 1) and in the southern part of this chamber, in the vicinity of the blocking wall (group 2) (see Chapter 3.3, Fig. 3.93, in this volume). Additionally, 2 bones were mixed with the human remains in the southern part of the chamber, and other bones were discovered in the central and southern part of chamber 2, as well as in the shaft and robber pit. One cattle and 2 ovicaprine bones were also found during

the excavation of the superstructure, but it seems that they were not connected with funerary rituals and got there accidentally. There were 605 bone and tooth fragments in total, among them 174 fragments that could not be identified to species. There were only cattle and ovicaprine remains present in these assemblages. The cattle bones came from 2 individuals: the first one was about 3.5–4 years old and the other was an adult (but only the tibia of this animal was found in chamber 2) [Table 8.14].

TABLE 8.14 Animal remains discovered in T.16

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1 (among human bones)	Rib	1			1		2 individuals: 1 about 3.5–4 years old, 1 adult (tibia only)
	Chamber 1, northern part, group no. 1, near beer jar	Sternum	1			1		
		Rib	22			1	present	
		Pelvis	14		1			
		Femur	16		1			
	Chamber 1, southern part, group no. 2, near beer jar	Rib	10	1				
		Humerus	15		1			
	Chamber 2, central and southern part	Lumbar vertebrae	5			1		
		Sacrum	4			1		
		Sternum	7			7		
		Rib	173	2	6	1	present on 6 fragments	
		Scapula	60	1				
		Humerus	1	1				
		Pelvis	13	1				
		Patella	1	1				
		Tibia	46	1	2			
		Talus	2	1	1			
		Ossa tarsi	3	2	1			
	Shaft, from damaged blocking wall, southern part	Rib	12			1		
	Shaft, central part, near damaged blocking wall	Femur	9	1				
	Shaft, central part	Skull	1			1		adult individual or individuals
	Shaft, south-eastern part	Tooth	1			1		
	From natural ground level, south-western part	Tibia	1		1			
	Robber pit, north-eastern part	Mandible	1			1		
Ovicaprine	Chamber 1 (among human bones)	Sternum	2			1		young individual
	Robber pit, central part	Scapula	2			1		adult individual or individuals
		Humerus	4			1		
	Robber pit, northern part	Tibia	2			1		
	From natural ground level, south-western part	Humerus	1			1		
	Superstructure, eastern part	Tibia	1			1		

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Group 1 in chamber 1 consisted exclusively of cattle remains (53 fragments from 4 bones) from the thorax and proximal part of a hind limb. Group 2 also consisted exclusively of cattle remains (25 fragments from 2 bones), which came from the thorax and proximal part of the forelimb. In the southern part, together with human remains, 1 cattle rib and 2 fragments of ovicaprine sternum were found.

Only cattle remains were also discovered in chamber 2. This was the most numerous assemblage from this grave (315 fragments from 30 bones) and it consisted of bones representing the thorax and proximal parts of the limbs.

Another 4 cattle bones were found in the central and south-eastern part of the shaft (a rib, femur, skull and tooth). The remains obtained from the robber pit and superstructure were very similar: in both cases there was 1 cattle bone and 2 or 3 ovicaprine bone fragments.

The only marks observed featured on cattle remains; no marks were observed on ovicaprine bones. A few bones had been chopped (sternum, rib, and tibia), filleted (rib) and in 2 cases it was possible to detect marks suggesting dismembering (a scapula bore a cut mark on the caudal angle, and another cut mark was also visible on the proximal end of a tibia). Additionally, a mild inflammatory process was noted on a cattle tibia near the line of fusion of the proximal end and of the shaft.

4.2.8 Tumulus 23

Only a few animal bones were discovered in chamber 2. They were not, however, submitted for analysis.

4.2.9 Tumulus 24

Animal bones were discovered in two chambers: 1 and 4. In chamber 1 they were found in the eastern part, mixed with human remains, and in the south-eastern part (see Chapter 3.3, Fig. 3.75). In chamber 4 they occupied the north-west corner of the chamber. Altogether, 1,171 bone fragments were recovered from this grave, 445 of which could not be identified. The majority of the bones came from cattle and ovicaprines; there were also 2 bird bones [Table 8.15]. Cattle remains came from 3 individuals: one was about 2–2.5 years old, the second was between 15–20 months and 3.5–4 years old, and the third one was an adult (it was represented by only 1 fragment of rib). Sheep remains belonged to 2 individuals: one younger, between 3–4 months and 3–3.5 years old, and one adult. Two adult goat bones were also found in this tumulus, which was unexpected in the context of the other graves. There were no goat bones in the studied material recovered from the chambers. Additionally, 2 bones (calcaneus and rib) belonged to an adult ovicaprine of undetermined species.

Some of the bones in chamber 1 were mixed with human remains; there were cattle and ovicaprine bones among them. It was possible to identify 9 ovicaprine bones (35 fragments) as belonging to sheep. Cattle, as well as ovicaprine remains, came from the thorax and proximal parts of limbs.

The majority of bone fragments were located in the south-eastern part of chamber 1. In the case of cattle, bone fragments were numerous, though the number of bones represented in this assemblage was rather low: 271 fragments from 15 bones. There were not only bones from the thorax and proximal parts of limbs but also a skull fragment. Head elements have very rarely been found in the burial and side chambers of the El-Zuma tumuli. The only examples recorded to date were those in chamber 1 of T.3 and chamber 1 of T.24. In both cases (a tooth from chamber 1 in T.3 and a fragment of skull from chamber 1 in T.24) only small fragments were found in the mixed bone material. It cannot be ruled out that they were put there intentionally; however, it is also probable that they got there accidentally. In both cases the chambers were looted and the materials mixed; therefore, the original content is not certain. In T.24 the ceiling of chamber 1 had collapsed, and the eastern part was covered with the fill of the superstructure (sand and gravel). Ovicaprine bones were also found in greater numbers in the south-eastern part of chamber 1, where 100 fragments from 19 bones were found. Two species were recognized in this material: sheep (only a pelvis could be identified) and goat (2 bones were determined: tibia and talus). The rest of the bones could not be identified to species. All ovicaprine bones came from the thorax and proximal parts of limbs. In this assemblage there were also 2 fragments of long bones that belonged to a bird. It was one of two examples of bird bones found in a burial chamber at El-Zuma. The second example of a bird bone was discovered in the burial chamber of T.21 (a type III tumulus). But these were not the only bird bones found inside the graves. They were also present among the bone material from the tunnels of type I tumuli (T.1, T.3, T.6, and T.8) with the mixed material, partially accidental. As the burial chambers of both T.21 and T.24 were looted and their ceilings collapsed, it seems probable that these bones were not part of the original content of the chambers.

An assemblage located originally in the north-western part of chamber 4 consisted of cattle and ovicaprine bones. There were 232 fragments from 14 cattle bones, among them bones from the thorax and proximal part of a hind limb. Only fragments of 1 rib belonged to an ovicaprine. The remains probably came from the same individuals as the remains in chamber 1.

TABLE 8.15 Animal remains discovered in T.24

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1, south-eastern part	Skull	1			1		3 individuals: 1 about 2–2.5 years old, 1 between 15–20 months and 3.5–4 years old, 1 adult (1 fragment of rib only)
		Lumbar vertebrae	3			2		
		Sternum	4			2		
		Rib	205	≥ 2	≥ 2	1	present on 30 fragments	
		Scapula	24	1				
		Humerus	16	1				
		Pelvis	10	1	1			
		Femur	8	1				
	Chamber 1, north-eastern part	Lumbar vertebrae	2			1	present	
		Rib	23			2?	present on 9 fragments	
		Scapula	17			1		
		Pelvis	5	1			present	
		Femur	3	1				
	Chamber 4, north-western part	Rib	192	4	4	2	present on 8 fragments	
		Tibia	38	1	1			
		Talus	2	1	1			
Sheep	Chamber 1 (among human bones)	Rib	15			1		2 individuals: 1 between 3–4 months and 3–3.5 years old, 1 adult (scapula, humerus and pelvis only)
		Scapula	1		1			
		Humerus	1		1			
		Radius	3		1			
		Ulna	2		1			
		Pelvis	5		1			
		Calcaneus	1		1			
	Chamber 1, south-eastern part	Pelvis	8	1 (part)	1			
	Chamber 1, north-eastern part	Scapula	6	1			present	
		Humerus	1	1				
Goat	Chamber 1, south-eastern part	Tibia	5	1				1 adult animal
		Talus	1	1				
Ovicaprine	Chamber 1 (among human bones)	Rib	4			1		from 2 of the above sheep (most of the bones come from the young individual, only calcaneus and rib come from the adult individual)
	Chamber 1, south-eastern part	Sternum	1			1		
		Rib	92	4	5	5	present on 14 fragments	
		Humerus	1	1				
		Pelvis	4		1			
		Tibia	1			1	present	
		Calcaneus	1		1			
	Chamber 1, north-eastern part	Rib	7			2		
		Pelvis	1	1 (part)				
		Femur	1			1		

TABLE 8.15 Animal remains discovered in T.24 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 4, north-western part	Rib	9			1		
Bird	Chamber 1, south-eastern part	long bones	2			2		1 individual

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Some of the bones bore post-consumption marks. Filleting marks were observed on both cattle (most of the ribs, a lumbar vertebra, sternum, and femur) and ovicaprine bones (ribs and a few sheep bones: scapula, humerus, radius, and pelvis). Cattle bones were additionally chopped (2 ribs, a pelvis, and femur).

4.2.10 Tumulus 26

Animal remains, as a part of offering deposits, were mostly placed in the chambers of the tomb, but two bones were also found among the bricks of a blocking wall. 553 animal bones and bone fragments were discovered in the tumulus, but because of their poor state of preservation (the specimens were dry and fragile) 98 fragments remain unidentified. The material came from one cattle and two sheep [Table 8.16]. The cattle remains belonged to an animal about 3.5–4 years old. The sheep bones came from two individuals: one about 15–20 months old and an older one aged about 3.5 years. Chamber 1 contained four beef cuts: ribs, two left humeri, and one right pelvis. In chamber 2 there were remains of two species: cattle and sheep. The cattle bones were found on the floor in the southern part of the chamber and inside two bowls slipped and burnished on both sides (Z26/24 and Z26/75). Three parts of the cattle carcass lay on the floor: a fragment of thorax, a big part of the left forelimb, and bones from the proximal part of the right hind limb. Cattle ribs and lumbar vertebrae had been put into bowl Z26/24 together with a sheep rib, two cuts from the proximal part of the forelimb, and 2 fragments of the proximal part of the hind limbs. In bowl Z26/75 there were only cattle ribs. Chamber 3 contained, among other things, cattle ribs and thoracic vertebrae, and part of a forelimb as well as part of a sheep thorax and right pelvis. In chamber 4 there were fewer animal remains: only cattle ribs and a sternum, mixed with two sheep femurs, were deposited on the floor. Some cattle and sheep bones bore marks of skinning, dismembering [Figs. 8.10, 8.11], chopping, and filleting [see Fig. 8.9].

4.3 Type III Tumuli

The discovery context of the animal bones from some of the type III tumuli has already been outlined elsewhere

(Iwaszczuk 2015, 428–429; Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 23–26).

4.3.1 Tumulus 17

Animal remains from this tumulus have already been discussed (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 23–26). It is interesting that this tomb was one of the two type III tumuli that contained not only ovicaprine but also cattle bones [Table 8.17]. In both cases only one cattle bone was found inside the chamber. Such a discovery is interesting in the light of other finds from these graves (see Chapter 3, in this volume). They were poorly equipped in comparison with graves such as T.21 and T.27, so the presence of cattle bone cannot be connected directly with the special status of the deceased. But the question about why these two bones were present in type III tumuli remains unresolved, unless we assume that the bones got into the chamber accidentally, which was possible but highly improbable given that cattle bones are big enough to not be accidentally moved along with sand.

4.3.2 Tumulus 18

No animal bones were recorded in this grave.

4.3.3 Tumulus 19

Only a few animal bones were found together with human remains in the burial chamber [Table 8.18]. A cattle rib came from an animal under 5 years old. There was also a sheep pelvis, as well as lumbar vertebrae, and the tibia of an ovicaprine. These bones probably belonged to a young individual under 15–20 months old. There were no marks on the bones.

4.3.4 Tumulus 20

The remains from this tumulus have been analysed before (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 23–25). They were very typical of the type III tumuli, and contained only ovicaprine remains found in the shaft (mixed with human remains), and the burial chamber (only 1 fragment of pelvis). The bones came from the proximal parts of limbs, but there was also 1 fragment of mandible found among human remains [Table 8.19].

FIGURE 8.11 Dismemberment and filleting marks visible on ovicaprine bones from El-Zuma: a—dismemberment marks on a sheep humerus; b—filleting marks on ovicaprine ribs; c—filleting marks on an ovicaprine tibia; d—dismemberment mark and probable skinning mark on a sheep pelvis
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TABLE 8.16 Animal remains discovered in T.26

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	6		1	2		1 individual: about 3.5–4 years old
		Humerus	4		1			
		Pelvis	6	1				
	Chamber 2	Lumbar vertebrae	5			2		
		Sternum	23			5		
		Rib	41	1	1	3		
		Pelvis	12		1			
		Femur	30	1	1			
		Patella	2	1	1			
		Tibia	15	1	1			
		Talus	1		1			
	Chamber 2, in vessel Z26/24	Lumbar vertebrae	5			1		
		Rib	12			2		
	Chamber 2, in vessel Z26/75	Rib	2			2	present on 1 fragment	
	Chamber 3	Thoracic vertebrae	14			4		
		Rib	32		1	3		
		Radius	3		1			
		Ossa carpi	5			5		

TABLE 8.16 Animal remains discovered in T.26 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 4	Sternum	7			2		adult individual or individuals
		Rib	25			3		
	Shaft, blocking wall	Rib	1			1		
		Humerus	1			1		
Sheep	Chamber 1	Tibia	4		1			2 individuals: 1 about 15–20 months old, 1 about 3.5 years old
	Chamber 2	Scapula	8	1	1			
		Humerus	9	1	1			
		Radius	4	1	1			
		Ulna	2		1			
		Femur	12	1	1		present on 5 fragments	
		Tibia	2		1			
	Chamber 2, in vessel Z26/24	Calcaneus	1	1				
		Talus	1	1				
	Chamber 3	Pelvis	4	1				
	Chamber 4	Femur	11	1	1			
Ovicaprine	Chamber 2	Rib	70	2	1	3		probably from 2 of the above sheep
		Lumbar vertebrae	2			2		
		Humerus	3		1			
		Ulna	1			1		
		Pelvis	5	1	1			
		Femur	10	1	1			
		Patella	1		1			
		Tibia	10	1	1			
		Calcaneus	1		1			
	Chamber 2, in vessel Z26/24	Rib	10			1		
		Scapula	6			1		
		Ulna	1	1		1		
		Femur	5		1			
		Patella	1		1			
		Centroquartale	1			1		
	Chamber 3	Lumbar vertebrae	7			2		
		Caudal vertebrae	1			1		
		Sacrum	4			1		
		Rib	7			1	present	

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TABLE 8.17 Animal remains discovered in T.17

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber	Ulna	3			1		1 individual
Sheep	Chamber	Sternum	2			2		1 individual: between 3 and 3.5 years old
		Femur	4	1				
		Tibia	1	1			present	
		Talus	1	1				
		Calcaneus	1	1				
		Centroquartale	1			1		
		Sesamoid	1	1				
Ovicaprine	Chamber	Rib	1			1		probably from the above sheep

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TABLE 8.18 Animal remains discovered in T.19

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber	Rib	2			1		young individual under 5 years old
Sheep	Chamber	Pelvis	3			1		probably 1 young individual under 15–20 months old
Ovicaprine	Chamber	Lumbar vertebrae	1			1		
		Tibia	2		1			

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TABLE 8.19 Animal remains discovered in T.20

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Shaft (among human bones)	Humerus	1			1		1 individual: under 3–3.5 years old
		Talus	1			1		
Ovicaprine	Chamber	Pelvis	2		1			probably from the above sheep
	Shaft (among human bones)	Mandible	4			1		
		Scapula	2			1		
		Ulna	1			1		
		Pelvis	2		1			

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TABLE 8.20 Animal remains discovered in T.21

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Chamber	Scapula	4		1			1 individual: about 3–4 months old
		Humerus	4		1			
		Radius	5		1			
		Tibia	3			1		
		Calcaneus	1			1		
		Talus	1			1		
		Metatarsus	2			1		
Ovicaprine	Chamber	Sternum	7			1		probably from the above individual
		Rib	30			7		
		Humerus	3	1				
		Ulna	2		1			
		Ossa carpi	1			1		
		Pelvis	4			1		
		Tibia	4			1		
Carnivore	Shaft	Ph I	2					adult
Bird	Chamber	Long bone	1			1		

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4.3.5 Tumulus 21

The animal remains have been described before (Iwaszczuk 2015). Sheep and a bird were the only species represented in this tumulus [Table 8.20]. The sheep bones came from the more valued parts of the carcass of an animal aged about 4 months.

4.3.6 Tumulus 22

Only bones from the re-excitation of the grave were submitted for analysis. The material, however, was mixed and the remains had no specified context, so they were not ultimately included in the analysis.

4.3.7 Tumulus 27

No animal bones were recorded in this tumulus.

4.3.8 Tumulus 28

Only 1 fragment of ovicaprine pelvis was found during the excavation of this tumulus. The fragment was, however, discovered in the superstructure of the grave, so it is probable that it was unconnected with any funerary rituals.

5 Discussion: Funerary Rituals on the Basis of Animal Remains

It seems that most of the animal remains found in El-Zuma were deposited in the graves during the funerary ritual or rituals. The rituals, however, were different in the case of the different types of tumuli. The most complicated rituals were performed for those buried in type I tumuli, the simplest ones for those interred in type III tumuli, which might have been connected with the social status of the people buried in the different types of tumuli. The most popular animal offerings, found in all types of tumuli, were food offerings, but there were also other types of rituals that left a material footprint in the form of animal remains. These will be analysed separately.

5.1 Food Offerings

The animal remains found in the grave chambers of all tumulus types represented bigger parts of cattle and sheep carcasses. These parts of the animal carcasses, probably prepared as meat cuts, were deposited in the tumuli as grave goods to serve the dead in the afterlife. Originally they were placed in the burial chamber as well as in the side chambers (not necessarily in all of them), but tomb robberies caused, among other things, their partial dis-

placement into the grave shafts, and in the case of type I tumuli probably also into the tunnels. Not all graves were, however, equipped with food offerings. Three tumuli of type III (T.18, T.27 and T.28) did not contain any animal remains either in their chambers or shafts.

There were notable differences between the contents of tumuli of different types. It seems characteristic of the biggest and most richly equipped tumuli (types I and II) that remains came from both cattle and sheep, sometimes even two individuals of each species were placed inside the grave (T.11, T.12, T.14, T.16). In T.13, T.15, and T.24 as many as 3 cattle carcasses were represented. The smallest tumuli (type III) contained only sheep bones, and in all cases only the remains of 1 animal were recorded. Only 2 exceptions from this rule are known: in each of two tumuli (T.17 and T.19), a single cattle bone was found together with ovicaprine remains.

It seems obvious on the basis of the recorded bones that only certain parts of the carcasses were used as offerings. In most cases, even if the bone material was mixed, the pattern of depositing whole parts of cattle and sheep carcasses (joints) was confirmed. In the excavated chambers of tumuli of types I and II both species, cattle and sheep, were represented by articulated and disarticulated thorax elements as well as forelimbs and hind limbs without extremities. Meat cuts came from top quality parts of the carcasses, with large amounts of meat. Cattle slaughtered for such offerings were usually young (under 3.5–4 years old) or relatively young (about 3.5–4 years old). Sheep were young (under 3.5 years old) or adult. No bones belonging to old individuals were found in ritual contexts, which confirms the careful choice of meat intended as food offerings. Such a pattern has also been noted at other cemeteries from the region, such as El-Sadda 1 (Osypińska 2007), Tanqasi (Osypińska 2008), El-Kassinger Bahry (Makowiecki 2007) and El-Detti (Iwaszczuk 2016). The young age of offertory animals was reported from all these sites. In the case of tumulus HP45/1 at El-Kassinger Bahry Makowiecki estimated the age of the slaughtered sheep at 12–15 months and 12–18 months old. Osypińska also confirmed the presence of relatively young ovicaprine bones, from individuals aged about 3.5 years, in graves 67 and 83 at El-Sadda. In tumulus 87 at Tanqasi the analysed ovicaprines were between 5 months and 3 years old; however, the cattle remains came from an animal over 4 years old. Almost exclusively young sheep and barely adult cattle remains were also discovered in El-Detti. No old animals were reported from any of these sites.

The presence of post-consumption marks, as well as marks suggesting skinning and dividing the carcasses into small pieces, also indicates that the deposited bones were

intended as food offerings. Such marks were also present on the bones from El-Kassinger Bahry (Makowiecki 2007) and El-Detti (Iwaszczuk 2016), but it is interesting that they were not reported from the Tanqasi and El-Sadda 1 cemeteries. It seems obvious that the animals were carefully chosen for these offerings. There were no preferences as to the side of the body from which the meat cuts were offered for the deceased. Carcasses were divided into smaller pieces, but in some cases bigger parts of carcasses, such as forelimb or hind limb without extremities, were placed among the other grave goods. In some cases a beef or mutton dish was also served: the presence of ribs and sometimes also other bones inside bowls, noted in type II tumuli, should be considered in such a context. There were 2 cases when bigger meat cuts were placed inside vessels: in chamber 3 of T.12 a number of cattle bones were registered in vessel Z12/125, and in chamber 2 of T.26 some sheep remains were found inside the small bowl Z26/24. In some instances (vessels Z13/11 from chamber 5 and Z13/27 from chamber 3 of T.13, vessel Z15/35 from chamber 2 of T.15, and vessels Z26/24 and Z26/75 from chamber 2 of T.26), the bones found inside the bowls may suggest that a liquid could have originally accompanied the bones—all these bowls were slipped and burnished on both sides, which helps to keep liquid inside the vessel. In other cases, bigger meat cuts were placed on the bowls and not inside them (e.g. fragments of cattle pelvis were found inside cup Z11/19 from chamber 2 in T.11 and around it)—perhaps they were also prepared in some way. In the case of the bowl (Z12/125) containing cattle bone fragments, the vessel was large and shallow, slipped only inside—a meat-dish could have been prepared and served in it for the dead.

The animals were probably slaughtered outside the cemetery and certainly outside the graves. No place which could have been used for butchering the animals and dividing the carcasses was found at the El-Zuma site either during the survey or during the excavations. This suggests two scenarios: the existence of such a place elsewhere, or the slaughtering of animals in the village inhabited by the society that buried its dead in the tumuli at El-Zuma. Both scenarios are equally probable in the light of available evidence.

5.2 Other Forms of Ritual

It seems probable that other forms of rituals besides food offerings also accompanied the funerals at El-Zuma in the Early Makurian period. The animal remains found in contexts other than chambers (and partially shafts) differ from the assemblages connected with food offerings. It is possible to discuss three types of such rituals on the basis

of animal remains: animal offerings accompanying funerary rituals, feasting during funerary rituals, and probable banquets after funerary rituals.

5.2.1 Animal Offerings Accompanying Funerary Rituals

Unusual animal bone fragments were found in the tunnels of type I tumuli. The zoological variety of the remains observed in the tunnels of T.1 and T.4 suggests the existence of different types of funerary rituals. At least one of these graves (T.4) was exceedingly well equipped (see Chapter 3.2, this volume). The presence in these structures of large fragments of skeletons of transport animals, such as camel and donkey, as well as gazelle bones, is reminiscent of the situation known from the tumuli at the cemetery in Qustul (Emery and Kirwan 1938, 27–74, Pls. 9, 11–14). Whole animal skeletons (cattle and ovicaprine as well as transport animals and dogs) were discovered there lying on the ramps and in the corridors of the very richly equipped graves (including Qustul tombs 17, 25 and 31). A similar situation was observed in Firka: for example, in tomb 11 at least one camel was buried lying on its side with its head directed down to the main chamber. The skull of this animal bore chopping marks (Kirwan 1935, 192, 193, Fig. 5). Altogether, skeletons of cattle, sheep, horse, and camel were discovered in three tumuli (nos. 11, 12, and 14), the biggest ones at the Firka cemetery. Transport animals, sometimes with decorative elements, such as bronze bells or necklaces of faience beads and cowrie shells, were found on the ramp, while cattle and sheep remains were usually located in the pit by the main chamber (Kirwan 1935, 192–194). Though the remains found in T.1 and T.4 in El-Zuma were broken into pieces, scattered along the tunnels and mixed with human bones and other finds, they represented different parts of the skeleton, not only the thorax and proximal parts of limbs as it was in the case of the remains found in the chambers of tumuli from this cemetery. Both tumuli were looted and robbers got to the graves through the shaft leading into the tunnel, so the graves were open for some time, which was attested by bat remains found in different levels of the fill of T.4, as well as by bird bones found in the tunnel of T.1, and some accidental finds, such as a single carnivore rib and two vertebrae in T.4. The other type I tumuli were also looted in this way and some remains, like the bird and micro-mammal bones from T.3, T.6, and T.8 or the single porcupine mandible found in T.3, suggest that the graves could have been accessed in this way at least some time after the looting. It seems, however, improbable that almost-whole skeletons of big mammals could get into the tunnels accidentally along with sand sliding down into the open tunnels. It is

therefore possible that similar rituals to those observed in Qustul and Firka may have been performed in the case of two tumuli at El-Zuma.

5.2.2 Feasting during Funerary Rituals

The question is, what happened to the carcass parts that remained after the offerings had been left inside the graves, as large fragments of them were not found among the food offerings. Probably they served as food during a feast that accompanied the funerary rituals, though no evidence to support this theory is provided by the animal remains from El-Zuma. It is possible that feasting also took place in the graves, or that people tried the dishes intended for the dead, because filleting marks were observed on the bones (usually on ribs, but not exclusively). Filleting marks are made when taking meat off the bone, which usually takes place when the meat is eaten (especially filleting marks observed on the ribs), and therefore they are commonly connected with the consumption and not with the preparation of meat.

5.2.3 Probable Banquet after Funerary Rituals

The remains of two sheep were found in the southern and south-eastern part of the shaft of T.12, on a level above the floor of the grave, in a separate cluster, together with a number of artefacts (mostly pottery) neatly placed (see Chapter 3.3, Fig. 3.45, this volume). Perhaps this kind of find was connected with a banquet that took place sometime after the funeral (as a layer of sand had already been formed by then) but before sealing the grave with the superstructure. Maybe also some other animal bone fragments discovered in the shafts of type II tumuli were the visible remains of such practices. There is also the possibility that this material was a component of the grave goods added there as a part of a separate ritual performed before the construction of the superstructure of the grave but, nevertheless, some time after the funeral and unconnected with a banquet.

5.3 Time of Death and Chronology of Funerary Rituals

As has been discussed before, it is probable that marks left by termites were recorded on the bones recovered from some graves at El-Zuma. If so, the implications for studies into ritual practices at El-Zuma are really interesting. The activity pattern of the colonies of some of the species of these small insects is especially noteworthy. According to Geerts, van der Linden, and van der Linden (2016) the maximum foraging activity of *Baicaliotermes hainesi*, the species of termite analysed by them, occurs only above 20°C. Backwell et al. (2012, 84) observed that *Trinervitermes trinervoides* do not forage during the June–August

period and during the hottest months. These authors are convinced, therefore, that the destruction of bones is seasonal and connected with the lifecycle of the termites. Furthermore, the research carried out by Backwell and her team (2012, 79, 84) showed clearly that termites consume bones not only for their protein and marrow lipid content but also because of various trace elements (calcium, phosphorous, and nitrogen), preferring fresh bones and bones with meat on them to fossilized ones. This was also confirmed by Thorne and Kimsey (1983) in their research. These two factors (seasonality and consumption of meat and fresh bones) are of great importance in the case of El-Zuma. On the one hand, the seasonality of termite activity indicates that burials took place during different seasons. The tumuli in which the bones gnawed by termites were recorded were probably visited by them in search of forage in those seasons with moderate temperatures, while the burials in the tumuli without such bones would have taken place during the coldest or the hottest seasons. It confirms that the cemetery was used by people during normal life-death cycles and was not connected with sudden deaths caused by diseases or war. On the other hand, the search for meat and bone protein and lipids, as well as minerals, must have attracted termites to remains that were relatively fresh. It seems that though termites can build long tunnels underground, they must be tempted to do so, therefore forage must have been available at least close to the surface. It is possible then that the graves were sealed with blocking deposits (tumuli of type I and II), as the animal offerings in the side chambers were mostly intact, but not necessarily covered with sand and gravel structures, at least for some time after the burial. There is also a possibility that the burial chambers were not equipped at the same time as the body was placed in the main chamber but sometime later, in one or more separate rituals, and the graves were covered with superstructures after these rituals had been completed. Type III tumuli contained virtually no bones gnawed by termites; the only fragment bearing such marks was discovered in T.17. It seems then that these graves were covered with superstructures almost immediately after the burial had taken place. It is interesting that the graves containing bones with termite gnawing marks were located in the central part of the cemetery, forming a strip of land indicating the existence of a path used by termites. But in this zone there were also graves without signs of termite activity, which confirms the theory of seasonality.

Rodent and bat remains were found in the tunnels of type I tumuli. It is possible, as discussed earlier, that gnawing marks were made by rodents (most probably not rats) while wearing down their incisors. If so, the bones

must have already been meat-free, and the rodent activity would have taken place sometime after the burial, maybe after the graves had been looted, when the tunnels were left open. The theory that the tunnels remained open for a longer time is supported by the presence of bat skeletons, exclusively of 1 species, in the tunnel of T.4. This suggests the existence of a colony of these animals in the shelter provided by the tunnel, which would have been accessible from the outside at that time. Additionally, bat excrement covered the floor along the walls of chamber 1 of T.6 (see Chapter 3.2, Fig. 3.35, this volume) and chamber 1 of T.7 (see Chapter 3.2, Fig. 3.41, this volume) suggesting its prolonged usage.

6 Summary

The animal remains discovered in the various tumulus structures at El-Zuma were connected with different types of rituals. Bones found in chambers, and partially in shafts (especially fragments mixed with human remains and other finds), were most probably deposited in the graves as food offerings. The number of animals slaughtered for this purpose differed depending on the tumulus type. The smallest tumuli (type III) were equipped with meat of only one young sheep or contained no meat offerings. Probably 1–3 young cattle and sheep were killed for meat that was used during the funerary rituals performed in type II tumuli. Additional rituals took place in the case of some type I tumuli. A large number of animals was slaughtered not only as food offerings but probably also as whole animal offerings (among them game and transport animals), which were deposited in the tunnels that most probably led to the burial chambers, maybe as animals to accompany the dead in the afterlife. The variety of rituals performed at El-Zuma sets this cemetery apart from other cemeteries in the region. It shows the wealth of some people buried there, as well as the social stratification of the society living in that neighbourhood during the Early Makurian period.

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