Archaeofauna 14 (2005): 139-170

Animal Mummies and Remains from the Necropolis of Elkab (Upper Egypt)

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(Received *20 May 2004*; accepted *26 October 2004*)

ABSTRACT: Animal remains and trace fossils from rock tombs and the surface of the necropolis at Elkab, and from the subterranean structures of the mastaba on top of the necropolis are analysed. They prove that the tombs were reused as depositories for animal mummies, especially large vultures and crocodiles, respectively associated with Nekhbet, the tutelary goddess of Upper Egypt, and Sobek. The use of the necropolis as an animal cemetery is dated to the Greco-Roman period on contextual evidence. In the mastaba, other animal mummies were identified and radiocarbon dated to the New Kingdom or early Third Intermediate Period. A taphonomic scenaro tries to explain these early mummies, mainly smaller predatory birds and cats, as well as finds of human skeletons in the mastaba and dating from the same general period. Other finds, mainly in the mastaba, are intrusive insect, microvertebrates and ichnofossils. Some victual mummies, grave goods and articles of adornment are other find categories in the necropolis and the mastaba.

KEYWORDS: ANIMAL MUMMIES, ANIMAL CEMETERY, VULTURES, CROCODILE, NEKHBET, SOBEK

RESUMEN: Se analizan los restos animales y fósiles traza recuperados en tumbas excavadas en roca y en la superficie de la necrópolis de Elkab, así como de estructuras subterráneas de la mastaba situada por encima de dicha necrópolis. EL estudio evidencia que las tumbas fueron reutilizadas como depósitos de momias animales, especialmente grandes buitres y cocodrilos que, en el Alto Egipto, se asocian con su diosa tutelar Nekhbet y con Sobek. El uso de la necrópolis como un cementerio de animales se sitúa en el período grecorromano sobre la base de evidencia contextual. En la mastaba se identificaron otras momias animales que se radiodataron a momentos del nuevo reino o de principios del tercer periodo intermedio. Un escenario tafonómico intenta explicar estas momias tempranas, principalmente de pequeñas aves de presa y gatos, al igual que los hallazgos de enterramientos humanos en la mastaba relacionándolos todos con un mismo periodo. Otros hallazgos, principalmente recuperados en la mastaba, están representados por insectos intrusivos, microvertebrados e ignofósiles. Algunas momias, ofrendas en las tumbas y objetos de adorno completanlas categorías detectadas en la necrópolis y la mastaba.

PALABRAS CLAVE: MOMIAS ANIMALES, CEMENTERIO DE ANIMALES, BUITRES, COCODRILO, NEKHBET, SOBEK

INTRODUCTION

Faunal research at Elkab started in 1996 when the author paid a first and exploratory visit to the Elkab necropolis (Figure 1). Mummified and other animal remains derived from Tomb 120 in the necropolis and the subterranean part of the mastaba on top of the necropolis were then discovered. They prompted more extensive, archaeozoological prospection and study of the Elkab necropolis, carried out from 1997 to 2000. Gautier & Hendrickx (1999) deal with the faunal discoveries from Tomb 120 and their archaeological significance; the results of this report are incorporated with some modifications in the present paper. For general information on Elkab, the reader is referred to the mentioned paper, Hendrickx (1999) and Limme (2001) summarising research at Elkab up to a few years ago.

On the basis of their provenance and partially for convenience sake, one can divide the faunal remains of the Elkab necropolis into the following assemblages (Figure 1).

Tomb 120: main sample 1996 and 1997 (Gautier & Hendrickx, 1999); some additional later finds.

Tomb 239: depository of mummified birds recognised in 1999; small sample taken in the same year.

Tomb 240B: depository of mummified birds recognised in 1999; small sample taken in the same year (mixed assemblage); contents of the two chambers sampled separately in 2000.

Tomb 242: depository of mummified crocodiles, sample taken in 2000.

Tomb 251: depository of mummified crocodiles, sample from the tomb and the slope in front of the tomb in 2000.

Mastaba, upper tomb: excavated and sampled in 1996 (Figure 2).

Mastaba, shaft: excavated and sampled from 1996 to 1999 (Figure 2).

Mastaba, lower tomb: excavated and sampled in 1999 (Figure 2). The mastaba is also known as Tomb 274.

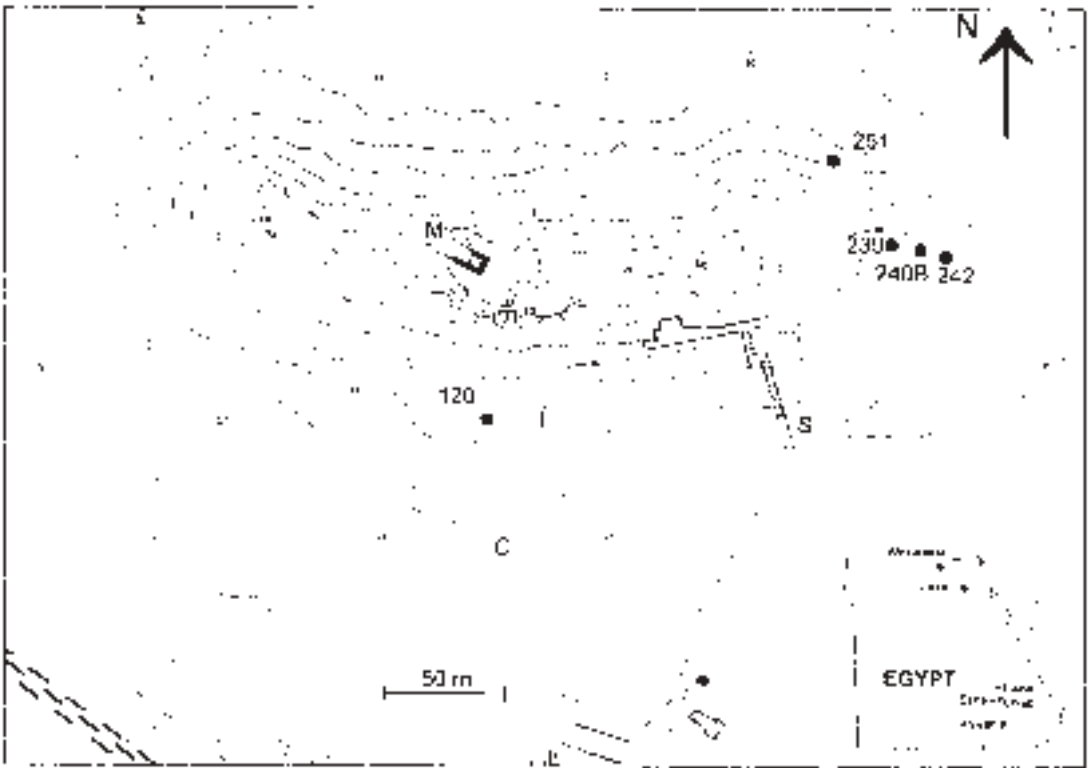

FIGURE 1

Location of Elkab and map of the necropolis. M: mastaba; C: 2nd Dynasty graveyard; P: parking lot; S: modern stairs open to the public; numbers : tombs with animal remains.

Near the mastaba: miscellaneous finds reworked during the excavation of the tombs and the shaft of the mastaba. Others are related to the mud-brick construction forming the upper part of the mastaba.

Miscellaneous finds: this assemblage includes surface finds essentially from the southern slope of the necropolis, west of the stairs and the tombs open to the public and finds from the several tombs excavated since 1987. Most finds come from the disturbed Old Kingdom tombs labeled BE1, BE3, BE6, BE14, BE17, BE19, BE20, BE22. BE18 is a not disturbed grave from the 18th dynasty. Grave 7a is located in the Second Dynasty cemetery on the lower slope of the necropolis (Hendrickx *et al*., 2002; Figure 2). The significance of these finds can generally be deduced from their nature and context (see 4. Taphonomic groups).

Most of the sorting and preliminary identifications had to be carried out in the excavation house of Elkab and only a limited number of remains were brought to the laboratory in Ghent. The identifications were completed with the aid of the comparative collection there and the much more extensive one of the Institut für Paläoanatomie und Geschichte der Tiermedizin (IPG) of the Munich University and literature available in both research units.

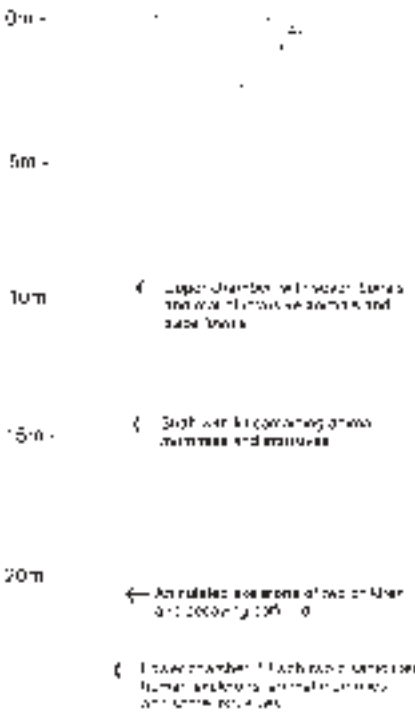

FIGURE 2

Simplified cross section through the subterranean structures of the mastaba with some of the finds.

THE ANIMALS ENCOUNTERED

Table 1 summarises the composition of the various assemblages. Notes on the animal groups encountered in these assemblages follow. In these notes data are incorporated dealing with biological and cultural aspects of the animals of Ancient Egypt, identified in settlements and among the mummified fauna. Main sources are Lortet & Gaillard (1903, 1907, 1909), Boessneck (1986, 1988), Houlihan (1986, 1995), Boessneck & von den Driesch (1989), Brewer & Friedman (1989), Kessler (1989), Katzmann (1990; archaeozoological record), Brewer *et al.* (1998), Osborn & Osbornova (1998). These references and the reference to the already published report on tomb 120 (Gautier & Hendrickx, 1999) will not always be repeated. Measurements were taken following von den Driesch (1976); a vertical line behind a column of measurements indicates measurements of one specimen or one skeleton. As the sections dealing with the animals encountered were completed end 2002, some recent faunal reports have not been considered.

SLIPPER WINKLE (*Nerita polita*?)

One perforated shell of a slipper winkle from Tomb 7a in the 2nd Dynasty cemetery was submitted for identification. It was collected near the cervical vertebrae of a human skeleton in the tomb. Other finds in the same context indicate clearly that the shells were used as beads for a necklace. Most likely we are dealing with *Nerita polita*. Records from slipper winkles or neretids from prehistoric and later contexts are listed under various names by Germain (1909) and Lortet & Gaillard (1909). Recent predynastic finds of worked *Nerita polita* come from Maadi (Boessneck *et al.*, 1989). In the tomb of Qa'a of Umm el-Qaab, a single *N. polita* was recorded (von den Driesch & Peters, 1996). Neretids were no doubt collected from the Red Sea.

ASSEMBLAGE / ANIMAL GROUP	Tomb 120	Tomb 239	Tomb 240B, chamber 1	Tomb 240B, chamber 2	Tomb 240B, mixed	Tomb 242	Tomb 251	Mastaba, lower tomb	Mastaba, shaft	Mastaba, upper tomb	Near mastaba	Miscellaneous	Remarks (b)
Slipper-winkle (Neritapolita?)	-	-	-	-	-	-	-	-	-	-	-	1	AA, part of necklace Tomb 7A
Cowreys (c)	-	-	-	-	-	-	-	-	5	-	-	3	AA
Spathopsis rubens	-	-	-	-	-	-	-	-	-	-	-	1	GG, Tomb BE20
Nile oyster (Etheria elliptica)	-	-	-	-	-	-	-	1	-	-	-	1	GG
Insect remains	-	-	-	-	-	-	-	R	R	F	-	RR	IN
Nile perch (Lates niloticus)	95	-	8	7	1	1	8	-	-	-	-	-	MU
Clarias /Heterobranchus (c)	-	-	-	-	-	1	1	-	-	-	-	-	MU
Frog/Toad (Anura spp.)	-	-	-	-	-	-	-	-	5	-	-	-	IN
Nile crocodile (Crocodylus niloticus)	-	-	52	16	1	200	3600	-	-	-	-	36	MU
Lizard	-	-	-	-	-	-	-	-	R	F	-	-	IN, coprolites
Soft-shelled turtle (Trionyx triunguis)	-	-	3	-	-	-	2	-	-	-	-	2	MU?
White Pelican (Pelicanus onocrotalus)	-	-	-	1	-	-	-	-	-	-	-	-	MU?
Pink-backed Pelican (P. rufescens)	1	-	-	-	-	-	-	-	-	-	-	-	GG, fan?
Yellow-billed Stork (Mycteria ibis)	-	-	-	-	-	-	-	-	-	-	-	1	MU
White or Black Stork (Ciconia ciconia /nigra)	-	-	2	2	1	-	-	-	-	-	-	-	MU
Sacred Ibis (Threskiornis aethiopicus)	1	3	F	F	-	-	-	-	-	-	-	1	MU
(Egyptian) Black Kite (Milvus migrans) (c)	2	-	-	1	-	-	-	-	-	-	-	-	MU
African Fish Eagle (Haliaeetus vocifer)	59	-	95	40	12	-	-	-	-	-	-	5	MU
Large vultures (Gyps/Torgos) (c)	300	20	800	800	200	-	-	-	-	-	-	45	MU
Egyptian Vulture (Neophron percnopterus)	30	-	13	24	3	-	-	15	-	-	-	-	MU
Marsh Harrier (Circus aeruginosus)	-	-	-	6	-	-	-	-	-	-	-	-	MU
Small Harrier (Circus sp.) (c)	-	-	1	-	-	-	-	-	-	-	-	-	MU
Sparrow Hawk (Accipiter nisus)	2	-	2	-	-	-	-	-	-	-	-	-	MU
Smaller Bustard (Buteo sp.) (c)	-	-	4	23	-	-	-	-	-	-	-	-	MU
Long-legged Bustard (B. rufinus)	1	-	1	5	-	-	-	-	-	-	-	-	MU
Lesser Spotted Eagle (Aquila pomarina)	-	-	-	1	-	-	-	-	-	-	-	-	MU
Imperial Eagle (Aheliaca)	1	1	-	-	1	-	-	-	-	-	-	-	MU
Verreauxs Eagle (A. verreauxi)	1	-	-	-	-	-	-	-	-	-	-	-	MU
Booted Eagle (Hieraaetus pennatus)	-	-	1	-	-	-	-	-	-	-	-	-	MU
Lanner Falcon (Falco biarmicus)	-	-	-	1	-	-	-	13	-	-	-	-	MU
Saker Falcon (Fcherrug)	1	-	-	-	-	-	-	-	-	-	-	-	MU
Peregrine Falcon (F. peregrinus)	-	-	1	-	-	-	-	-	-	-	-	-	MU
Turkey (Meleagris gallopavo f. domestica)	-	-	-	1	-	-	-	-	-	-	-	-	late IN
Common Quail (Coturnix coturnix)	-	-	-	-	-	-	-	2	12	-	-	-	IN
Spotted Crake (Porzana porzana)	-	-	-	-	-	-	-	-	-	3	-	-	IN
Arabian Bustard (Ardeotis arabs)	-	-	1	-	1	-	-	-	-	-	-	-	MU
Rock Pigeon (Columba livia) (c)	-	-	-	-	-	-	-	18	20	9	-	-	IN, also eggshell, coprolites
Turtle Dove (Streptopelia turtur)	-	-	-	-	-	-	-	1	2	-	-	-	IN
Palm Dove (S. senegalensis)	-	-	-	-	-	-	-	-	1	-	-	-	IN
Barn Owl (Tyto alba)	-	-	-	2	-	-	-	119	88	-	-	-	MU
Eagle Owl (Bubobubo) (c)	-	-	-	-	-	-	-	-	F	FF	-	-	IN, regurgitation pellets
Short-eared Owl (Asiflammeus)	-	-	-	1	-	-	-	5	-	-	-	-	MU
Barn Swallow (Hirundo rustica)	-	-	-	-	-	-	-	-	-	1	-	-	IN
House Sparrow (Passer domesticus)	-	-	-	-	-	-	-	R	R	R	-	-	IN
Brown-necked Raven (Corvusruficolis)	-	-	1	-	-	-	-	-	13	-	1	-	MU
not identified birds (Aves spp.)	R	-	R	R	-	R	R	R	R	R	R	-	IN, MU
Dwarf shrew (Crocidura nana)	-	-	-	-	-	-	-	1	1	-	-	-	IN
Bats (Chiroptera) (c)	-	-	-	-	-	-	-	RR	5	-	-	-	IN
Greater gerbil (Gerbillus pyramidum)	-	-	-	-	-	-	-	5	RR	4	-	-	IN
Nile rat (Arvicanthis niloticus)	-	-	-	-	-	-	-	18	F	F	R	-	IN
House mouse (Mus musculus)	-	-	-	-	-	-	-	54	F	FF	R	-	IN
Hare (Lepus capensis)	1	-	-	-	-	-	2	-	-	-	-	-	MU
Domestic cat (Felis silvestris f. catus)	6	3	2	-	-	-	-	F	F	-	6	2	MU
Dog (Canis lupus f. familiaris)	1	-	-	-	-	-	2	-	-	-	-	-	MU
Hippopotamus (Hippopotamus amphibius)	7	-	-	-	-	-	-	-	-	-	-	-	MU
Dorcas gazelle (Gazella dorcas)	6	-	-	-	-	-	-	-	-	-	-	1	MU
Sheep/goat (d)	3	-	9	21	-	1	8	1	-	-	-	1	MU, VM
Cattle (Bosprimigenius f. taurus)	70	-	2	1	-	1	4	-	11	-	1	45	MU, VM

TABLE 1

Faunal remains from the Elkab necropolis (a) Specimen counts, often approximate; R(R): (very) rare; (F)F: (very) frequent. (b) Taphonomic categories: AA: article of adornment; GG: grave good; IN: intrusive; MU: mummified animal(s); VM: victual mummy. Provenance of single finds, etc. (c) See comments in text. (d) *Ovis ammon* f. aries/*Capra aegagrus* f. hircus.

INSECT REMAINS

Such remains occur quite frequently in the upper mastaba tomb. A sample of these remains was sent for identifiation to Dr. P. Grootaert in the Royal Belgian Institute of Natural Sciences, Brussels. The finds include empty pupae of the domestic fly, *Musca domestica*, empty pupae of a large flesh fly, *Sarcophaga* sp., skeletal fragments of the scarab, *Scarabeus sacer*, and tenebrionids, and cells of a carpenter bee, *Xylocopa* sp. Remains of fly pupae and beetles occur also in the shaft and the lower tomb of the mastaba. Incidental finds from elsewhere comprise some beetle remains in a jug from Tomb BE18 and *Xylocopa* cells in a jug from Tomb BE23. The flies were no doubt attracted by wet decomposing material in the upper mastaba tomb, the tenebrionids and the scarab by drier decomposing material and fecal matter. *Xylopoca* burrows in dead wood and may be responsible for the degradation of the sarcophagi found in the upper mastaba tomb. Panagiotakopulu (2001) reviewed the entomological finds from Ancient Egypt; her tabulation does not include *Sarcophaga* and *Xylocopa*, the other insect groups have already been recorded.

COWRIES (CYPRAEACEAE spp. indet.)

An incomplete small cowry was spotted on the slope of the necropolis, as well as a larger one, most likely representing a different species. The area opposite the aperture had been removed in the smaller cowry, as is still done to string together cowries into articles of adornment. It was impossible to see whether the larger cowry had been modified. Five worked small cowries were also collected near the ankle of one of the skeletons of two children in the mastaba shaft. They are no doubt remnants of a ankle bangle. Grave BE 20 yielded another worked small cowry near the neck of a secundarily buried child (700-300 BC?). Several cypraeid species attest to the commerce and use of these marine gasteropods in Ancient Egypt (Germain, 1909; Lortet & Gaillard, 1909) and in prehistoric Egypt (Gautier, 2001).

Spathopsis rubens

This large freshwater bivalve is represented in the fill of Tomb BE20 by a left valve, which does not show any sign of being worked. The tomb dates from the Old Kingdom, but was reused much later (700-300 BC?). Germain (1909) and Lortet & Gaillard (1909) cite this typical species of the Nile from prehistoric and pharaonic contexts, as various species with the generic name *Aspatharia* or *Spatha*. These "species" are but ecophenotypical variants of the species now called *Spathopsis rubens* (Van Damme, 1984). Falkner (1982) lists more finds; two of these demonstrate that *Spathopsis* shells were used as shallow receptacles, in one case very probably containing a green cosmetic.

NILE OYSTER (*Etheria elliptica*)

Two finds can be referred to this oyster-like freshwater bivalve. On the surface of the necropolis a large upper valve was spotted. Another upper valve, modified into a kind of spoon or small receptacle came from the fill in the lower tomb of the mastaba. As in the case of *Spathopsis rubens*, Germain (1909) and Lortet & Gaillard (1909) and list some prehistoric and later finds, using the generic label *Aetheria*. More finds are listed by Falkner (1982), one of these was apparently used as a receptacle for kohl.

NILE PERCH (*Lates niloticus*)

From Tomb 120, some 95 cranial and postcranial remains were identified as Nile Perch, apparently representing two individuals of appreciable size. The identifications were confirmed by Dr. W. Van Neer (Royal Museum of Central Africa), who estimated the standard length, i.e., the length from snout to base of tail, of the first and best represented individual at about 120 cm; the second one measured about 90 cm. Other remains of large Nile perch, mainly vertebrae, were collected from Tombs 242 and 251 and from both chambers in Tomb 240B. The Nile Perch is a typical species of the Nile and most East African lakes. It is often portrayed in the art of Ancient Egypt, mainly in fishing scenes, and associated with the goddess Neith worshiped in the town of Latopolis (Esna), where thousands of mummified specimens of Nile Perch have been found. It is also a quite common species in prehistoric and later fish faunas of settlements in Ancient Egypt.

CLARIID CATFISH (*Clarias* sp. and *Heterobranchus* sp.?)

In Tomb 242 a cranial roof fragment represents a very large clariid, attaining some 100 cm. Inside Tomb 251 a pectoral spine of an animal attributable to *Clarias* occurred, representing an individual

with a standard length of some 60-70 cm. Both specimens were identified by Dr. W. Van Neer (Royal Museum of Central Africa, Tervuren). The clariid catfish of the Nile system are *Clarias lazera* and *C. anguillaris*, *Heterobranchus bidorsalis* and *H. longifilis*. *Clarias* was often figured, but only two representations have been recorded of *Heterobranchus*. In the mummified fauna only *C. lazera* would be present. In prehistoric and later settlements finds of clariid catfish, especially *Clarias*, are often encountered. Most likely both finds represent *Clarias*.

FROGS AND/OR TOADS (ANURA sp. indet.)

In the upper fill of the mastaba shaft some postcranial remains of anurans were found, referable to a small and a much larger species. The latter remains probably pertain to one animal and some hide is still sticking to the bones. The smaller form is represented by four remains referable to two animals. Lack of diagnostic features and comparative material precluded further identification of the finds. Kessler (1989: 22) cites mummified frogs and toads from animal cemeteries at Thebes and from the Samoun Cave, Manfalut, el Ma'abda; in another list (*ibid.*: 34) he cites specifically the common frog from Egypt, *Rana mascarensis*. Boessneck (1988: 117) refers to mummified anurans described from a collection in Berlin including possibly *Bufo viridis* and *Rana mascarensis*. In our case, the presence of *B. viridis* can probably be excluded, as this species is confined to Lower Egypt. According to Houlihan (1995) frogs and toads or anurans combining traits of both groups are often represented in Ancient Egyptian art. Because of their highly visible fecundity, they became symbols of self-propagation and the regeneration of life. These considerations do not concern us, because the Elkab frogs are no doubt intrusives.

NILE CROCODILE (*Crocodylus niloticus*) (Plate I, Figures 2 and 3)

In 1996 some thirty remains, including a jaw fragment, vertebrae and dermal plates of a large crocodile were collected in a small area on the slope of the necropolis. The clustered finds indicate that we are probably dealing with the remains of a single individual which by chance survived weathering and dispersal until now. Measurements of dermal plates, vertebrae and the alveoles in the jaw fragment were compared with those of a large crocodile in the IPG collection; probably we are dealing with one individual measuring about three meters or somewhat more. Some six remains collected a year later from the same area may represent the same individual. Exploration of the tombs east of the modern stairs to the tombs open to the public in 1999 revealed the presence of crocodile remains in Tombs 242 and 251. From the first tomb some 200 remains were collected, from the second one about 2.400 remains; on the slope in front of the tomb another 1.200 remains were picked up, no doubt derived from this tomb. Most of these remains show more or less marked traces of exposure to fire (see chapter 7). Measurements of various postcranial bones were compared with those of a small crocodile from the IPG collection. The collections from Tombs 242 and 251 included animals varying in size between about 100 cm and more than 5 m. Remains of new-born animals, which reach sizes of ca. 26-34 cm have not been seen; under optimal conditions Nile crocodiles may reach lengths of about 7 m. The absence of very young crocodiles is probably due to the marked degradation of the material through prolonged exposure to fire. As known, the crocodile played a major role in cultic life and as a sacred animal it was associated with the god Sobek. It was often portrayed and thousands of mummies and eggs have been reported from many cemeteries. It is also a regular element in the archaeofauna from Ancient Egyptian settlements. Today is has disappeared from the Egyptian Nile, but it is apparently doing well in Lake Nasser. Tomb 240B also yielded some remains of larger crocodiles, but these appear not to have been burned.

SOFT-SHELLED TURTLE (*Trionyx triunguis*) (Plate I, Figure 1)

Two carapace fragments with the typical vermiculate pattern of this large freshwater turtle were collected from Tomb BE14. Another carapace find occurred among the crocodile remains collected inside Tomb 251; a second burned fragment was spotted among the crocodile "rubble" in front of the tomb. Tomb 240B, chamber 1, yielded three more fragments. The species occurs in various sites, from Merimde-Benisalama to Elephantine as a food animal, apparently caught now and then in

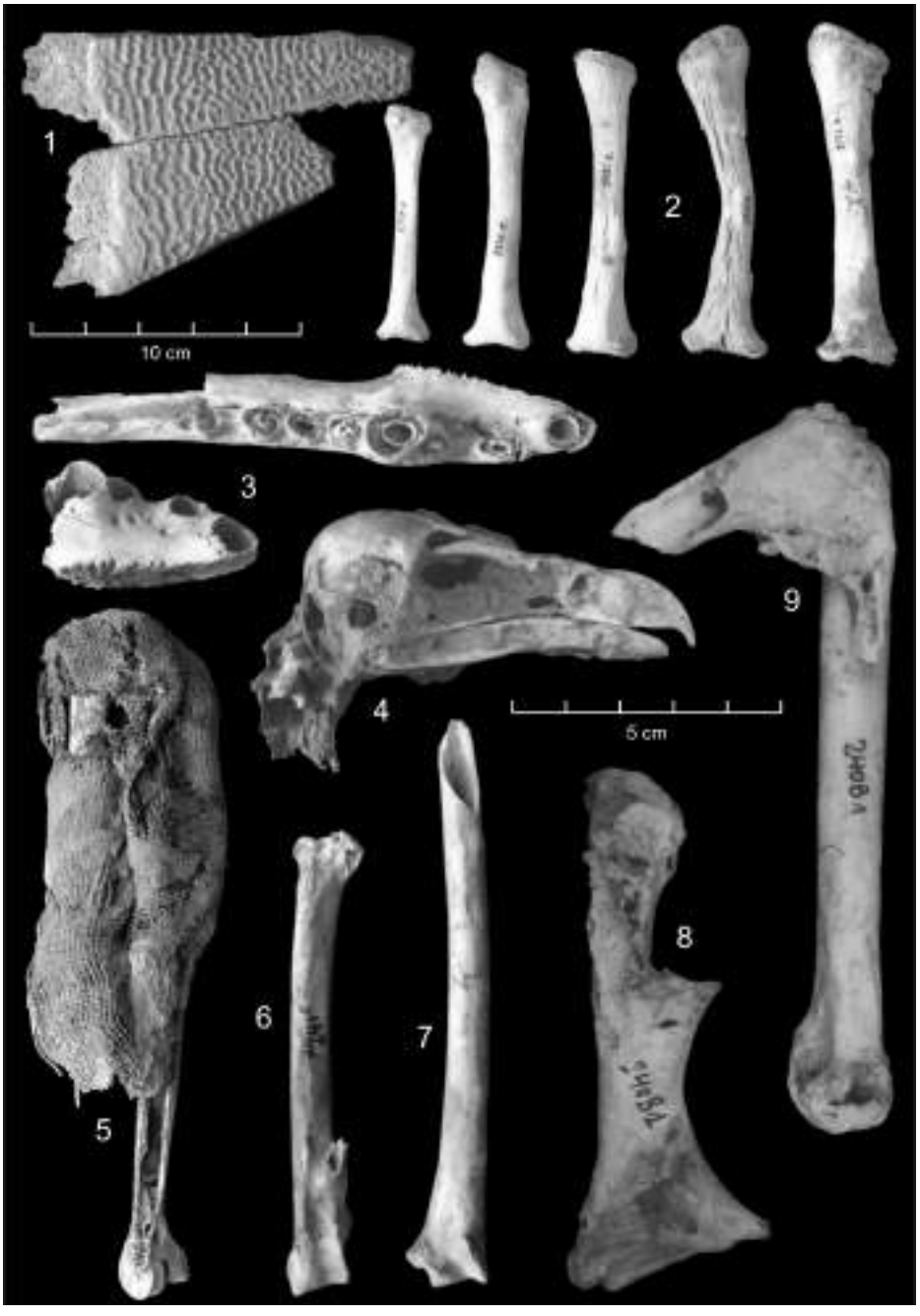

PLATE I

Figure 1: Carapace fragments of Soft-shelled turtle *Trionyx unguis*. Tomb 240B, chamber 1.
Figure 2: Series of radii of Nile crocodile, *Crocodylus niloticus*; some with marked evidence of exposure to fire. Tomb 251.
Figure 3: Lower and upper jaw fragments of Nile crocodile, *Crocodylus niloticus*. Tomb 251.
Figure 4: Head of mummified Griffon Vulture, *Gyps fulvus*. Tomb 240B, chamber 1.
Figure 5: Fragmentary mummy of Sacred Ibis, *Threskiornis aethiopicus*, containing only legbones. Tomb 240B, chamber 1.
Figures 6 and 7: Incomplete carpometacarpus and distal ulna of large bustard, probably Arabian bustard, *Ardeotis arabs*. Tomb 240B.
Figure 8: Coracoid of Griffon or Lapped-faced vulture with excresences in proximal articular facets. Tomb 240B.
Figure 9: Pathologial ulna of Griffon or Lapped-faced vulture. Tomb 240B.

the nets of fishermen or speared. The animal is not known as a mummy, but was sometimes represented in art. According to Houlihan (1995), it came to be viewed as an enemy of the sun-god Ra and regarded as a symbol of evil, like the male hippopotamus, because of its secretive behaviour and vicious bite. It does not occur in the extensive offering-list menus of the privileged classes and apparently was not heaped among the victuals before the deceased in tomb scenes.

WHITE PELICAN (*Pelicanus onocrotalus*)

One large humerus of which the proximal and distal end are missing, collected in Tomb 240B, chamber 2, could be matched with humeri of *P. onocrotalus* in the IPG collection, as to size and the quite marked muscular attachment scar on the lateral side distally (Lorch, 1992). The White Pelican is still widely distributed in Africa and a winter guest in Egypt, but it nested in the country in former times (Boessneck 1988, especially fig. 163). The Dalmatian Pelican, *P. crispus*, has a patchy distribution from south-eastern Europe to China and comes as a winter guest to the northernmost part of Egypt, but as its African relative (next section), it may have been a resident in former times. Finds of White Pelican are recorded from Merimde-Benisalama, ed-Dab'a and Elephantine (Boessneck & von den Driesch 1999; Katzmann 1990). No mummified specimens have yet been described and the White Pelican is rare in the iconographic bestiary of Ancient Egypt; so is the Dalmatian one.

PINK-BACKED PELICAN (*Pelicanus rufescens*)

One distal moiety of a slender and large humerus from Tomb 120 compares well with the homologous part in skeletons of *Pelicanus rufescens* in the Munich collection. Its distal width is 37.0 mm and falls within the range of these measurements (35.8-38.4 mm) given by Lorch (1992); the other pelicans occurring in Africa and measured by the same author are clearly larger. Lorch records furthermore that the Pink-backed Pelican is widely distributed in subsaharan Africa; nowadays it is an exceptional winter guest in Upper Egypt, but in former times it may have bred in the valley. Pelicans with a "non-shaggy" plumage are depicted in Pharaonic art, represented either the species discussed here, the pelican dealt with in the previous section (*P. onocrotalus*) or both. The Pink-backed Pelican has until now been recorded only from Elephantine. Mummies of this pelican are not known and the Elkab find is not derived from a mummified individual: midway on the shaft of the bone transverse cutmarks occur near the broken off end; they suggest repeated trials to divide the bone until it finally snapped at one of the cuts.

YELLOW-BILLED STORK (*Mycteria ibis*)

A distal moiety of a tarsometatarsus of this stork was found on the surface of the necropolis. Its distal width is 17.8 mm and its large vascular foramen is diagnostic for the Yellow-Billed Stork (Gruber, 1990). Today the Yellow-Billed Stork is found in Africa south of the Sahara; occasionally it comes to Egypt as a summer guest. Probably it was less rare in former times, especially in Upper Egypt, as bone finds recorded by Gruber (1990), Katzmann (1990) and von den Driesch (1997) suggest. In tomb 10 in the Valley of Queens, Thebes, two postcranial remains were identified in a bundle together with a gnawed pelvis of a Sacred Ibis (*Threskiornis aethiopicus*) (Boessneck & von den Driesch, 1989). As far as I know, no complete mummified individuals have been recorded; apparently the bird also does not figure in Ancient Egyptian art as do other storks.

WHITE AND BLACK STORK (*Ciconia ciconia* and *C. nigra*)

Some remains attributable to *Ciconia* were found in Tomb 240B: two proximal humerus fragments in chamber 1, a coracoid and a proximal femur in chamber 2. A distal ulna collected in 1999 was not provenanced.

coracoid,	GL:	±79.0	
	Lm:	70.5	
humerus,	Bp:	39.2	±35.5
ulna,	Dd:	±15.0	
femur,	Bp:	22.0	

Except for the smaller humerus, the measurements fall well within the range of *Ciconia.* The coracoid and femur show diagnostic features of

White Stork, while the ulna could be derived from a Black Stork (Gruber, 1990). Attribution of the humerus remains is difficult, the larger find is no doubt White or Black Stork, but the smaller one could belong to the Yellow-Billed Stork. Most parsimoniously combined and assuming that the smaller humerus belongs indeed to a *Ciconia*, the finds represent four animals. Both White and Black Stork have been found in prehistoric and Pharaonic contexts in Egypt, while mummified White Sorks have been recorded from Tuna-el-Gebel. Either White or Black Stork occur but sporadically in the Ancient Egyptian iconographic bestiary, although both were known as migrants to the south or visitors in winter.

SACRED IBIS (*Threskiornis aethiopicus*) (Plate I, Figure 5)

One coracoid of this wading bird has already been described from the spoils of Tomb 120. The surface survey yielded one distal tarsometatarsus and the small sample from Tomb 239 contained some three burned long bone fragments.. Most finds come from Tomb 240B, in which more or less complete mummy bundles, parts of mummies and isolated bones were collected in both chambers, representing at least some 21 animals, mainly adults. A small, damaged bundle from chamber 1 contains only remains of a leg, that is, the complete tarsometatarsus and the distal moiety of the tibiotarsus; the phalanges may originally also have been present. The Tomb 240B collection contained also a distal tarsometatarsus with marked bone excrescences midshaft and similar minor modifications of the articular end.

The measurements can be compared with the extensive measurements on ibis mummies from Tuna-el-Gebel (Boessneck & von den Driesch, 1987). These mummies show considerable variation in size, indicating the presence of both males and females, but also that the Pharaonic ibises attained in general a large size with respect to their present day relatives. This would be due to better living conditions or to the fact that the Pharaonic ibis represents an extinct subspecies. The Sacred Ibis is represented by innumerable specimens among the mummified avifauna of Egypt, as the finds of Tuna-el-Gebel and elsewhere indicate. It also figures frequently in Pharaonic art and in hieroglyphs and was reportedly still common in the country to about 1800. Its disappearance can be linked with the increasing human disturbance and the loss of its prime marshy habitats as a result of land reclamation.

radius,	GL:	152.4							
	Bd:	9.9							
ulna,	GL:	135.5	137.5	140.8	142.2	15.06	160.5	161.6	
	Bp:	12.0	12.1	12.2	12.0	13.6	14.2	14.2	
	Dd:	11.5	11.7	12.0	11.0	12.4	-	12.6	
humerus,	GL:	121	121.2	132.0	134.2	137.0	142.6	142.6	
	Bp:	-	-	-	30.4	-	30.9	31.2	
	Bd:	19.8	19.8	21.9	±22	21.2	23.0	22.9	
cmc,	GL:	68.2	79.3						
	Bp:	14.5	17.0						
	Dd:	10.0	11.0						
coracoid,	Lm:	±50	53.6						
femur,	GL:	79.0	±80	81.1	81.1	86.2	86.3		
	Bp:	17.1	16.5	16.2	16.6	16.8	17.2		
	Bd:	17.6	16.2	16.3	16.5	18.3	-		
tibiotarsus,	GL:	158.0	±170	±177	±178				
	Bd:	12.3	-	14.0	-				
tmt,	GL:	106.0	106.3	110.6	111.6	118.4	126.1	126.0	129.7
	Bp:	14.9	14.8	16.0	-	15.9	16.6	±16.5	18.3
	Bd::	15.0	14.3	15.6	15.0	15.6	-	-	17.8

(EGYPTIAN) BLACK KITE (*Milvus migrans aegyptius*?)

A proximal humerus and two incomplete ulnae from Tomb 120 compare favourably with recent material of European Black Kite, *Milvus migrans migrans*, in the IPG-collection. The idenfication of a single tarsometatarsus from Tomb 240B, chamber 2, was confirmed by Prof. Dr. A. von den Driesch (Munich).

humerus,	Bp:	21.7
ulna,	SC:	5.6
	Did:	10.4
tmt,	GL:	50.4
	Bp:	11.1

M. m. migrans is known in Egypt as a winter guest, while *M. m. aegyptius* is the smaller resident form. Both have been identified among the birds of Ancient Egypt and osteometric data are provided by Boessneck and von den Driesch (1982, 1987, 1989) and Katzmann (1990). These data as well as those on the Central European Black Kite (Otto, 1981) indicate that the Elkab finds derive from small individuals. Most likely they represent the resident Black Kite. Recently *M. migrans* has been recorded from late Predynastic Buto in the Delta (von den Driesch, 1997); the measurements suggest the animal belongs to the resident form. Both this kite and the visiting European Black Kite occur in the mummified avifauna of Egypt, but the Egyptian form is probably more frequent. Black Kites are also figured in Pharaonic art. These birds are very sociable, opportunistic and bold scavengers and Bruun & Baha El Din (1994: 22-23, plate 4) present them as still common birds near towns and villages in Egypt, living on carrion, small animals and sometimes fish.

AFRICAN FISH EAGLE (*Haliaeetus vocifer*)

Some sixty remains in the main collection from Tomb 120 were attributed to this eagle, representing some eleven animals. Tomb 240B yielded some 150 remains, which combine into six animals (chamber 1), twelve animals (chamber 2) and three animals in the mixed sample from 1999. The identity of the new material was checked in Munich. The available data for the collection from Tomb 120 were also rechecked and indicate that at least one find (a distal humerus) represents *Aquila heliaca* (see there). The identification of some other remains from Tomb 120 may also be questionable and for that reason not all the already published measurements are repeated in the following tabulation, which includes only the finds of which the identification was checked in Munich. The range of the tarsometatarsi attributed to *H. vocifer* in the field is ca. 86.5-95 mm, suggesting a preference for females (see Boessneck, 1985: 21).

humerus,	GL:	173.0	174.6	
	Bp:	-	330	
	Bd:	25.6	26.9	28.6
ulna,	Gl:	205.1		
	Bp:	16.9		
	Bd:	14.8		
carpometacarpus,	GL:	90.9		
	Bp:	21.4		
femur,	Bd:	21.0		
tibiotarsus,	GL:	153.0		
	Bd:	18.8	19.0	
tmt,	GL:	82.0	85.5	
	Bp:	17.9	17.5	
	Bd:	20.0	21.2	22.8

Boessneck (1985, 1987) established the presence of the African Fish Eagle among the mummified avifauna of Egypt and in the fauna of Elephantine. It had been previously confused with the White-Tailed Eagle, *Haliaeetus albicilla*, a resident breeder in the Nile Delta until recently and still a sporadic winter guest in Lower Egypt. As its name implies, the eagle discussed in this section is an African species and as other birds it formerly lived in Egypt. Fish eagles do not appear to have attracted the attention of the Ancient Egyptians and would not figure in their iconographic bestiary.

GRIFFON VULTURE (*Gyps fulvus*) AND LAPPET-FACED VULTURE (*Torgos tracheliotus*)
(Plate I, Figures 4, 8 and 9;
Plate II, Figures 1, 2 and 3)

In the already published collection from Tomb 120, most of the remains are derived from large vultures, of which some 300 bones or bone fragments were counted, corresponding to some 34 individuals. The bones did not show clear morphological differences indicating the presence of more than one species; samples and drawings compared well with recent material of *Gyps fulvus*

PLATE II

Figure 1: Tarsometatarsus of Lapped-faced Vulture, *Torgos tracheliotus.* Tomb 240B, mixed assemblage.
Figure 2: Pathological leg of Griffon Vulture, *Gyps fulvus*. Tomb 240B.
Figure 3: Tarsometatarsus of Griffon Vulture, *Gyps fulvus.* Tomb 120.
Figure 4: Pathological humerus of Egyptian Vulture, *Neophron percnopterus.* Tomb 240B, chamber 1.
Figures 5 & 6: Mandibles of a small and a large domestic cat, *Felis silvestris* f. catus. Mastaba, lower shaft.
Figure 7: Pathological subadult femur of domestic cat, *Felis silvestris* f. catus. Mastaba, lower shaft.
Figure 8: Tarsometarsus of Verreaux's Eagle, *Aquila verreauxi*. Tomb 120.
Figure 9: Pathology of Egyptian Vulture, *Neophron percnopterus*.Tomb 240B, chamber 1.

in Munich. However, Tomb 240B yielded remains of both this vulture and the Lappet-faced Vulture, be it that the first species is much more frequent and I may have overlooked some less diagnostic remains of the second species in Tomb 120. Therefore, the already published measurements may not all refer to *Gyps fulvus*.

From Tomb 240B some 1600 remains of large vultures were extracted, including cranial and postcranial remains with mummified tissue still adhering. Lack of time precluded a detailed analysis of these remains, but the tarsometatarsal remains establish clearly the presence of the two larger vultures mentioned: the tarsometatarsus of the Lappet-faced Vulture is decidedly larger and more gracile than its homologue in the Griffon Vulture. The chamber 1 remains add up to about 43 individuals of which on the basis of the ratio of the tarsometarsi about 12 would be Lappet-faced Vultures; the chamber 2 remains represent some 44 individuals with about the same quantity of the named vulture. The mixed assemblage collected in 1999 adds several individuals to the given counts and Griffon Vulture again predominates. In fact, the ratio of Griffon Vulture: Lappet-faces Vulture is about 3:1 in the three samples according to the identified tarsometarsi. Some 20 fragments of larger vultures were also found in the small sample of tomb 239. Measurements on the best preserved tarsometarsi are summarized below.

Gyps

Tmt,	GL:	95.5 -	111.8	(n: 17)
	Bp:	23.3 -	25.5	
	Bd:	25.1 -	28.0	

Torgos

Tmt,	GL:	132.0 -	145.5	(n: 15)
	Bp:	28.0 -	29.4	
	Bd:	30.0 -	30.0	

From the surface of the necropolis some 45 long bone remains of larger vultures were collected including three coarticulating phalanges with part of the mummified tissue around them. A more or less complete skull with still adhering soft tissue and linnen, was collected in 1987 in the fill of Tomb BE3; Dr. W. Van Neer (Royal Museum of Central Africa, Tervuren) identified it correctly as *Gyps fulvus*.

Quite a few postcranial remains from Tomb 240B show pathological modifications, listed summarily in what follows.

coracoid: marked excrescences and changes of proximal end, chamber 1 (Plate I, Figure 8).

humerus: marked bone rarefication and exostoses of proximal end, mixed assemblage; marked excrescences proximally, chamber 2; idem proximally and distally, chamber 2.

ulna: fracture distal half with marked excrescences, and probably false joint, mixed assemblage; distal fracture healed with callus and fistular, chamber 1; healed midshaft fracture, with marked excrescences and fistular, bones set at marked angle, probably Griffon Vulture, chamber 2 (Plate I, Figure 9).

carpometacarpus: marked excrescences proximally, Griffon Vulture, chamber 2.

femur: marked excrescences and fistulars proximally, chamber 2.

tibiotarsus: midshaft marked excrescences, probably fracture and false joint, chamber 2; marked excrescences and fistular proximally, chamber 1; idem chamber 2; healed fracture of distal shaft, with marked extoses and fistular; bones overlap and set at an angle, chamber 2.

tarsometatarsus: lateral exostoses upper shaft, mixed assemblage; healed fracture with marked exostoses and fistular, bones set at an angle, Griffon Vulture, mixed assemblage (Plate II, Figure 2).

Lortet & Gaillard (1905: 284) give the impression that the Griffon Vulture is the larger vulture most frequently mummified, but the list in Kessler (1989) suggests that the Lappet-faced Vulture is also well represented. The Griffon Vulture may still be breeding in the eastern half of Egypt, but migrating individuals pass through other parts of the country. The guide of common Egyptian birds by Bruun & Baha El Din (1994) records it as a former sociable breeder and a passage and winter visitor. It seems to have impressed Ancient Egyptians and it appears frequently in their religeous iconography. A famous, often reproduced painted relief picture (Houlihan, 1986: 40, figure 56), although much conventionalized, occurs on a wall of the mortuary temple of Queen Hatshepsut at Deir el Bahari (18th Dynasty), representing the vulture goddess Nekhbet, the tutelary deity of Upper Egypt. The Lappet-faced Vulture is still a resident, not sociable breeder in Egypt, building its nests in acacias; as the Griffon Vulture, it is no longer a common sight in the country. In Pharaonic art, it is often figured, but it is not unusual that images combine features of both Griffon and Lappet-faced Vulture, and perhaps even other large vultures.

EGYPTIAN VULTURE (*Neophron percnopterus*) (Plate II, Figures 4 and 9)

Some thirty postcranial remains from Tomb 120 represent a small vulture and can be combined into two or three individuals. Selected long bones specimens compared well with material of *Neophron percnopterus* in Munich. More material was collected from Tomb 240B, chamber 1 combining into some two animals, and from chamber 2 combining into three animals. Some remains in the mixed sample from the same tomb represent one or two animals. The lower mastaba tomb yielded remains of one more animal.

coracoid,	GL:	±61	-	
	Lm:	52.5	51.2	
humerus,	GL:	143.0	147.5	151.5
	Bp:	29.4	31.0	±24.0
radius,	GL:	171.5		
ulna,	GL:	160.0	168.1	177.2
	Bp:	13.8	14.9	15.5
	Did:	11.9	12.5	13.9
cmc,	GL:	83.6		
	Bp:	18.8		
	Did:	11.2		
femur,	GL:	73.6	76.2	77.2
	Bp:	18.2	19.0	17.8
	Bd:	18.0	17.2	18.2
tibiotarsus,	GL:	121.0	123.2	
	Dip:	20.2	19.0	
	Bd:	14.0	14.0	
tmt,	GL:	76.4	77.5	86.4
	Bp:	±15	±14	15.4
	Bd:	16.5	15.5	16.8

Bone excrescences and a fistula were visible on the shaft of a humerus, and a femur showed a fracture healed without reduction (Plate II, Figures 4 and 9); both come from Tomb 240B, chamber 1. The Egyptian Vulture was until recently a very common bird in Egypt. Flocks, referred to by early travellers as “Pharaoh’s hens”, apparently because of their white plumage and general indifference towards human presence, could be seen daily feeding on carrion and offal around human settlements. Nevertheless, it is not common in the iconographic bestiary of Ancient Egypt. It is also rare among the mummified birds and in the archaeofaunas from settlements in Ancient Egypt. Bruun & Baha El Din (1994: 22-23, plate 4, figure 8) figure it in their little guide as “an uncommon resident breeding bird and passage migrant”.

MARSH HARRIER (*Circus aeruginosus*)

A larger harrier is represented in Tomb 240B, chamber 2, by three tibiotarsi and three tarsometatarsi, representing two animals.

tibiotarsus,	GL:	111.6
	Bd:	10.9
tmt,	GL:	89.7
	Bp:	11.2
	Bd:	12.0

The finds compare well with their homologs of *C. aeruginosus* in the IPG-collection and their measurements fall within the range of this harrier (Schmidt-Burger, 1982). The species is known from the mummified fauna, but has not yet been recorded from any settlement in Ancient Egypt.

SMALL HARRIER, PROBABLY PALLID HARRIER (*Circus macrourus*) OR HEN HARRIER *(C. cyaneus*)

A single humerus from Tomb 240B, chamber 1, compares favourably with its homolog in Montagu’s Harrier, *C. pygargus* in the IPG collection.

GL:	84.8
Bp:	15.8
Bd:	12.9

The specimen could derive from the mentioned species, but also from the Hen Harrier, *C. cyaneus*, or the Pallid Harrier, *Circus macrourus*, as these species overlap in size. Measurements of the *C. pygargus* and *C. cyaneus* are given by Otto (1981) and Schmidt-Burger (1982). Boessneck & von den Driesch (1987) identified *C. macrourus* and possibly *C. cyaneus* in the mummified avifauna from Tuna-el-Gebel, on the basis of size, skeletal proportions and the fact that *C. pygargus* is a rare winter guest in Egypt, while *C. macrourus* is the most abundant harrier in the country. Lortet & Gaillard (1903) identified mummies of the three species mentioned here, *C. cyaneus* being the most frequent. Most likely the Elkab find represents either *C. macrourus* or *C. cyaneus*. Harriers have not yet been recorded from the archaeofaunas from Egyptian settlements. Apparently they do not figure in the iconographic bestiary.

SPARROWHAWK (*Accipiter nisus*)

The early assemblage collected from the spoils of Tomb 120 yielded a distal humerus of this predatory bird; a later find from the same tomb is a fragmentary carpometacarpus. A complete humerus and another fragmentary carpometacarpus represent probably one individual in Tomb 240B, chamber 2. In size and morphology the material compares well with recent material in Ghent and Munich.

humerus,	GL:	60.0	
	Bp:	13.9	
	Bd:	11.8	±12.2
cmc,	GL:	40.1	
	Bp:	9.5	

The Sparrowhawk is a common winter guest in Egypt and a quite frequent species in the mummified avifauna. According to Houlihan (1985), early investigators have claimed that the Horus Falcon was inspired by the Sparrowhawk, but the Horus Falcon appears to be a composite of various falcon species (*Falco* spp.) occurring in Egypt. The Sparrowhawk itself appears not to have been figured in Egyptian art.

SMALLER BUSTARD, MAINLY LONG-LEGGED BUSTARD (*B. rufinus cirtensis*)

A dozen remains of this buzzard were collected in Tomb 240B; they combine into four individuals in chamber 2 and one individual in chamber 1. Morphologically and sizewise the remains compare favourably with recent *Buteo* material in Ghent and Munich.

humerus,	GL:	112.2	111.0
	Bp:	22.0	-
	Bd:	19.5	17.0
coracoid,	GL:	±45.5	45.5
	Lm:	38.2	39.0
ulna,	GL:	130.0	
	Bp:	12.0	
	Did:	10.2	
cmc,	GL:	64.2	
	Bp:	14.3	
femur,	GL:	74.4	
	Bp:	12.6	
	Bd:	13.8	
tibiotarsus,	GL:	102.8	
	Dip:	15.2	
	Bd:	12.4	

The finds fall in the upper range of the Common Buzzard specimens measured by Otto (1981) and Schmidt-Burger (1982) and mostly representing the nominate subspecies *B. b. buteo*. *B. b. vulpinus* is smaller than this subspecies and a winter guest in Egypt. A resident in Egypt is the smaller subspecies of the Long-legged Buzzard known as *B. rufinus cirtensis*. Probably the finds described can be attributed mostly to this buzzard. Smaller bustards occur quite frequently in the mummified fauna of Egypt, and would include *B. rufinus cirtensis*, *B. buteo vulpinus* and perhaps *B. b buteo*. A distal moiety of a tibiotarsus of a small buzzard from the Satet temple at Elephantine has been identified as *B. b. vulpinus*. The Long-legged Buzzard occurs in the iconographic bestiary of Ancient Egypt as a hieroglyph; most likely the resident form was the basic model.

LONG-LEGGED BUZZARD (*Buteo rufinus rufinus*)

A large buzzard is represented in Tomb 240B, chamber 2, by a few bones adding up to two individuals; a single femur comes from chamber 1 in the same tomb. A distal fragment of a tarsometatarsus collected in 1999 from Tomb 120, completes the sample.

coracoid,	GL:	53.90	±52	
	Lm:	47.6	45.2	
femur,	GL:	89.2		
	Bp:	17.0		
	Bd:	18.1		
tmt,	GL:	90.9	94.0	
	Bp:	15.5	14.5	
	Bd:	17.0	-	16.8

These finds are decidedly larger than their homologs described in the previous section and no doubt represent the nominate subspecies of the Long-legged Buzzard, *B. r. rufinus*. This buzzard visits Egypt in winter, but quite a few mummies of this visitor have been recorded. To my knowledge, it has not yet been recorded from settlements in Ancient Egypt.

LESSER SPOTTED EAGLE (*Aquila pomarina*)

One almost complete tibiotarsus from Tomb 240B, chamber 2, compared well with its homolog of *A. pomarina* in Munich. It has been gnawed by

a small carnivore and only the distal width could be measured (Bd: 16.4). Boessneck & von den Driesch (1989) have drawn the attention to the fact that the bones of the Lesser Spotted Eagle are not easily distinguished from those of the Long-legged Buzzard, *Buteo rufinus rufinus*. Moreover, both this buzzard (see previous section) and *A. pomarina* are quite well known in the mummified avifauna. Prof. Dr. A. von den Driesch (Munich) kindly confirmed the identification of the specimen as a remnant of a female *A. pomarina*. The species visits Egypt in winter.

IMPERIAL EAGLE (*Aquila heliaca*)

Three finds have been identified in Munich as belonging to this eagle. Tomb 239 yielded a complete ulna. A complete femur was sampled in 1999 from Tomb 240B and a distal humerus from the main sample from Tomb 120 was inadvertently misidentified as *Haliaeetus vocifer* (see there).

humerus,	Bd:	28.2
radius,	GL:	210.0
	BD:	15.0
femur,	GL:	106.0
	Bp:	23.6
	Bd:	25.5

The Imperial Eagle has been identified in various samples of the mummified avifauna in Egypt. The neolithic settlement at Maadi yielded a few bones. The Imperial Eagle is a Palaearctic winter migrant to Egypt, Ethiopia and Sudan, straggling south to Kenya. It appears not in the iconographic bestiary of the Ancient Egyptians.

VERREAUX'S EAGLE (*Aquila verreauxi*) (Plate II, Figure 8)

One larger tarsometatarsus of slender habitus and with a marked, elongate *trochlea metatarsi I* represents an eagle in Tomb 120.

tmt,	GL:	113.9
	Bp:	24.0
	SC:	10.8
	Bd:	25.5

The specimen compared morphologically very well with metatarsi of two *Aquila verreauxi* (GL: 104.8; 105) in the IPG collection but is somewhat larger. Verreaux's Eagle seems to be about the size of the Golden Eagle, *A. chrysaetos*, or somewhat larger, but is apparently of more slender habitus (Brown *et al.*, 1982: 414). Measurements of metatarsi of the latter for this eagle, but also that it is more gracile. On the strength of the foregoing, this single find is attributed to *A. verreauxi*. Today this eagle is still widely distributed in subsaharan Africa and would still live along the coast of the northern Sudan (Brown *et al., ibid.*). According to Hollom *et al*. (1988) it still breeds in the extreme southeast corner of Egypt. No doubt the Ancient Egyptians were familiar with this eagle, especially in Upper Egypt, but, they did not include it in their iconographic bestiary. This is the first record of the species as a mummy, but it may well be present among not well studied mummified avifauna from other sites.

BOOTED EAGLE (*Hieraeetus pennatus*)

A fragmentary humerus from Tomb 240B, chamber 1, seems to be derived from a female of this smaller eagle. Prof. Dr. A. von den Driesch (Munich) confirmed the identification. The species is a winter guest in Egypt, of which only a few mummies have yet been described.

LANNER FALCON (*Falco biarmicus*), SAKER FALCON (*F. cherrug*) AND PEREGRINE FALCON (*F. peregrinus*)

In the lower mastaba tomb, one large and slender falcon is represented by several postcranial, in part paired long bones (measurements first column). The attribution to *Falco* was verified in Ghent and Munich. The size of the bones suggest an identification as either Lanner Falcon or the somewhat larger, Saker Falcon, but the tibiotarsus of the Lanner Falcon would be more slender than its homolog in the Saker Falcon (Boessneck & von den Driesch, 1987: 129-132). The tibiotarsus of our specimen appears to be relatively slender and therefore the animal is put on record as a female Lanner Falcon. Prof. Dr. A. von den Driesch (Munich) confirmed the identification of the carpometacarpus. Other falconid finds are a fragmentary ulna and a tibiotarsus collected in Tomb 240B, chamber 2 and 1. A large ulna was found in 1999 near Tomb 120.

coracoid,	GL:	±47		
	Lm:	43.2		
humerus,	GL:	83.9		
	Bp:	18.9		
	Bd:	14.9		
radius,	GL:	90.8		
ulna,	GL:	97.2		
	Bp:	10.3	9.9	12.0
	Did:	9.6		
cmc,	GL:	57.5		
	Bp:	14.4		
femur,	GL:	66.8		
	Bp:	12.0		
	Bd:	12.2		
tibiotarsus,	GL:	±86	±69	
	Bd:	12.0	±8.8	
tmt,	GL:	53.0		
	Bp:	11.9		
	Bd:	12.4		

The measurements of the ulna from Tomb 240B, chamber 2, represent probably another Lanner Falcon. The larger proximal ulna half from Tomb 120 would then represent a Saker Falcon. As to the small tibiotarsus from Tomb 240B, chamber 1, it derives from the Egyptian Peregrine Falcon (*F. peregrinus*), which some label as a different species, *F. pelegrinoides*. Mummies of this falcon have been found quite often; those of Lanner Falcon are also quite frequent, the Saker Falcon being less well represented. The first two species are resident breeders in Egypt, while the third visits the country in winter. In the iconographic bestiary of Ancient Egypt large falcon traits appear to be combined to represent the Horus Falcon.

TURKEY (*Meleagris gallopavo* f. domestica)

Among the avian remains of Tomb 240B, chamber 2, an incomplete femur of a larger bird was collected, which did not compare with any of its homologs in the expected avifauna. Prof. Dr. A. von den Driesch (Munich) provided the identification of this mysterious find. It became later clear that the preservation of the bone is slightly different from that of the fresher looking bones of avian mummies. No doubt, a scavenger introduced this leftover of a consumed turkey in Tomb 240B.

COMMON QUAIL (*Coturnix coturnix*)

This small bird is represented by 12 postcranial bones in the upper tomb of the mastaba and two bones in the mastaba shaft fill. The identification was completed with the aid of the IPG collection.

humerus,	GL:	33.0	33.0
	Bp:	7.0	7.0
	Bd:	5.0	4.9
ulna,	GL:	±30	
	Bp:	3.3	
	Did:	3.8	
femur,	GL:	37.1	
	Bp:	6.3	
	Bd:	5.1	
tarsometatarsus,	GL:	25.0	
	Bp:	4.2	
	Bd:	4.4	

Quail is a breeding resident in the Delta and migrant visitor Egypt in winter, formerly seen in large numbers. It has been found in some sites, from Merimde-Benisalama to Elephantine. Mummies are not known, but the bird is frequently represented in both hieroglyphs and Egyptian art. Some of the bones show traces of etching indicating that they are derived from regurgitation pellets. As far as I could ascertain, it is absent from recent regurgitation pellets from the slopes of the necropolis.

SPOTTED CRAKE (*Porzana porzana*) OR WATER RAIL (*Rallus aquaticus*)

A complete left humerus, its incomplete right counterpart, and a fragmentary tarsometatarsus of a rallid, apparently representing one individual, occur among the small remains from the upper mastaba tomb. They compare well with material from both species in the title of this section, in the IPG collection, and in that of the Laboratorio de Arqueozoología, Universidad Autónoma de Madrid. The measurements of both species overlap (Boessneck *et al*., 1979: 308) and I hesitate to provide a definite identification. The complete humerus (L: 35.7) is quite small and would hence suggest the presence of the smaller species, Spotted Crake. Both this species and the Water Rail are winter visitors in Egypt, but the second one also breeds in the Delta. Some of both species were

found in a few sites, but the birds do not figure in the iconographic bestiary of Ancient Egypt and mummies are lacking.

LARGE BUSTARD, PROBABLY ARABIAN BUSTARD (*Ardeotis arabs*) (Plate I, Figures 6 and 7)

A distal ulna and an incomplete carpometacarpus (GL: ±84), respectively from Tomb 240B, chamber 1 and Tomb 240B, without provenance, show clearly diagnostic features typical for bustards and compare favourably with their homologs of the Kori Bustard or *Ardeotis kori*, represented in the IPG collection by a male and a female. They are about 0.9 times smaller than those of the female. The Kori Bustard is confined to East Africa and southern Africa. In the southern Sahel, the Arabian Bustard occurs ranging up to the Batn-el-Haggar in the Sudan; formerly it was also a resident in Morocco. The Arabian Bustard is somewhat smaller than the Kori Bustard (Urban *et al.,* 1986). Von den Driesch & Boessneck (1985) record a large bustard from Merimde-Benisalama as either Arabian Bustard or Great Bustard, *Otis tarda*. The latter is an Eurasian species, also occurring in Morocco as a resident and as a vagrant in the Maghreb (Urban *et al., ibid.*). Most likely the Elkab finds derive from a (male) Arabian Bustard; as in the case of other African birds, the range of this bustard apparently extended further north in former times. Reed & Osborn (1978) think that this bustard is figured on the handle of the Tutanchamon ostrich feather fan.

ROCK PIGEON (*Columba livia*) AND DOMESTIC PIGEON (*C. livia* f. domestica)?

Some fifty postcranial remains of *Columba* occur in the shaft and both tombs of the mastaba. They can be combined into two individuals (upper tomb), another two individuals and a juvenile (shaft), and some seven individuals and a juvenile (lower tomb). Among the upper tomb finds a co-articulating coracoid and first phalanx and a co-articulating tibiotarsus and tarsometatarsus occur.

coracoid,	GL:	31.5	32.4	±33		
	Lm:	30.3	30.9	31.3		
humerus,	GL:	41.5	41.8	42.0	42.2	43.0
	Bp:	-	15.2	15.2	-	-
	Bd:	9.7	10.2	10.0	10.3	9.9
radius,	GL:	44.2	45.2	46.4		
ulna,	GL:	47.0	47.4	48.2	48.8	
	Bp:	5.6	±6	6.0	6.1	
	Did:	5.8	6.1	6.3	6.4	
cmc,	GL:	32.3				
	Bp:	8.8				
femur,	GL:	37.0	37.8	38.0		
	Bp:	7.2	8.0	7.8		
	Bd:	6.8	7.2	7.2		
tibiotarsus,	GL:	49.2	51.3	51.5	52.5	
	Dip:	-	7.7	7.8	-	
	Bd:	5.6	5.7	5.8	5.9	
tmt,	GL:	27.0	27.9			
	Bp:	6.0	6.0			
	Bd:	±7	6.8			

The measurements are somewhat smaller than the minima given for the Rock Pigeon by Fick (1974) or fall in the lowermost range. The Rock Pigeon appears to have been domesticated in the Asiatic Levant already in the fifth millennium before our era (Benecke, 1994: 386); therefore both the wild and domestic form of the species may be present at Elkab, as well as bastard forms. Primitive domestic pigeons resemble very much their wild relatives. In the course of time forms exceeding clearly the wild forms in size evolve; forms somewhat smaller than the latter may also exist, if we may rely on the measurements recorded by Fick (1974). The small size of some of the Elkab finds might indicate the presence of such small domestic pigeons, but it may also indicate that southern forms of *Columbia livia* are smaller than the predominantly European individuals measured by Fick (1974). Finds of Rock Pigeon or its domestic descendant are known from two sites (Katzmann, 1990: 57, table 5).

Today, the Rock Pigeon inhabits rocky upland areas in Egypt nesting in crevices or caves and the co-articulating finds derive most likely from natural mummies of animals nesting in the upper tomb. One intact bird egg as well as quite a few eggshell fragments were collected from this structure. Unfortunately, the whole egg broke, revealing its dried reddish brown content of mixed yolk and egg white. The egg was subelliptical, measuring about 35 by 27 mm; shell thickness about 0.2 mm.

The shell has been discoloured by its originally fluid content as indicated by diffusion bands. It is now very light yellow-orange but was probably white in the fresh state. The foregoing characteristics (see Evans, 1972; Sidell, 1993) suggest the finds can be attributed to a rather small Rock Pigeon. Attribution to Eagle Owl, which left its regurgitation pellets in the tomb (see 3. Trace fossils) is not possible, because the eggs of this owl are much larger and more rounded (Dahl, 1925).

Rock Pigeon or its domestic relative have not yet been recorded among the mummified avifauna. Few representations exist and the first firm evidence for pigeon cotes in Egypt comes from the Greco-Roman period (Benecke, 1994). All the foregoing suggests that domestic pigeons may not have been common until late. The archaeozoological record of the wild form of this pigeon and/or its domestic relative is very restricted; a recent record concerns funerary food gifts in the royal necropolis of Umm-el-Qaab (Dreyer *et al.*, 2000).

TURTLE DOVE (*Streptopelia turtur*) AND PALM DOVE (*S. senegalensis*)

Two complete coracoids and a fragmentary tarsometatarsus collected in the mastaba shaft are derived from smaller columbids; the lower tomb yielded a proximal humerus fragment.

coracoid,	LG:	27.6	24.6
	Lm:	26.2	23.2
humerus,	Bp:	9.8	
tmt,	SC:	2.3	

The measurements for the first column fall in the range of comparable measurements for the Turtle Dove assembled by Fick (1974). The second coracoid is decidedly smaller and would therefore represent the smaller Palm or Laughing Dove (Hollom *et al.*, 1988). Both this dove and the Turtle Dove are residents of Egypt and I have seen frequently Palm Doves around human settlements; the Turtle Dove is less frequent in these contexts. Turtle Doves figure frequently in the iconography of Ancient Egypt, while other dove-like animals, perhaps Palm Dove, are less obvious. No mummies have yet been recorded and bone finds are very rare. Recently published finds from the Predynastic royal necropolis of Umm-el-Qaab concern funerary food gifts of both Turtle and Palm Dove (Dreyer *et al.*, 2000). Bird finds from recent regurgitation pellets from the necropolis include dove, probably Turtle Dove.

BARN OWL (*Tyto alba*)

Remains of owls were collected in the fill of the shaft of the mastaba at various depths and from the lower mastaba tomb. The shaft finds comprise two fragmentary, but still easily recognisable skulls, a skull fragment and 85 postcranial remains derived from some seven animals; among the postcranial remains four tarsometatarsi with co-articulating phalanges and mummified tissue indicate clearly we are dealing with the remains of mummified birds. The lower tomb yielded some 120 remains from some 14 individuals. A fragmentary humerus and femur testify in Tomb 240B, chamber 2 derive from an exceptionally small individual with very thin walled bones and an estimated femur length of some 45 mm.

coracoid,	GL:	±35	35.4					
	Lm:	32.6	33.6					
humerus,	GL:	82.2	86.1	86.4	86.8	87.6		
	Bp:	14.2	14.5	14.3	14.6	14.7		
	Bd:	13.0	13.3	13.5	13.3	-	12.8	
radius,	GL:	92.6	95.2	96.2	104.6			
ulna,	GL:	93.9	98.9	99.9	±100	102.5	102.6	
	Bp:	8.2	8.4	8.0	-	8.9	8.4	
	Did:	6.8	7.3	a7.0	7.0	7.5	7.0	6.8
femur,	GL:	±45	48.3	49.0	53.2	53.2	53.6	
	Bp:	-	9.2	9.0	9.9	9.3	9.5	
	Bd:	-	9.6	9.4	10.1	9.6	9.9	9.9
tibiotarsus,	GL:	91.9	92.8	97.6				
	Dip:	11.2	11.2	10.6				
	Bp:	9.4	9.9	9.5	9.0			
tmt,	GL:	±57.5	63.5	67.0	68.6			
	Bp:	8.4	8.1	9.4	10.			
	Bd:	-	9.5	11.0	11.2			

Morphologically the skulls and long bones compare well with their homologs in *Tyto alba* (Langer, 1980), but the measurements fall in the upper range of those for this owl given by the author, or are somewhat larger. The admittedly imprecise measurements of a tibiotarsus and a tarsometatarsus provided by Lortet & Gaillard (1903: 170) also indicate large animals, suggesting that the Barn Owl, which is a resident breeder in Egypt, is somewhat larger there than further north. The Barn Owl prefers open country and nests in holes in trees, buildings, ruins etc. It is extremely common as a hieroglyph and quite common in the icono-

graphic bestiary of Ancient Egypt; several mummies of this owl are also known. Two sites from the Delta (Tell ed Dab'a, Tell Maskhuta) yielded a few finds. A more recent record concerns an incomplete skeleton from Buto, again in the Delta (von den Driesch, 1997); this animal is large but still within the size range of the European form.

SHORT-EARED OWL (*Asio flammeus*)

This owl is represented by two coracoids, a femur and two tarsometatarsi in the lower mastaba tomb, clearly derived from one mummified animal. In Tomb 240B, chamber 2, a single coracoid was collected. These finds compare favourably with IPG material and exhibit the diagnostic features of *Asio flammeus* as recorded, e.g., the second *linea trochanterica* on the lower mediocranial femur shaft typical for *Asio* (LANGER, 1980: 161, fig. 27).

coracoid,	GL:	34.8	37.2	37.3
	Lm:	33.0	-	35.6
femur,	GL:	59.1		
	Bp:	10.3		
	Bd:	10.4		
tmt,	GL:	46.7	46.8	
	Bp:	9.5	9.7	
	Bd:	10.8	10.7	

The Short-Eared Owl is a winter visitor and passant visitor in Egypt, also known from the mummified avifauna. Until now, it has not been identified in the Pharaonic iconography, which shows "eared" owls, attributed to either Eagle Owl (*Bubo bubo*) or Long-Eared Owl (*Asio otus*), both resident breeders in Egypt, or a combination of features of both species.

BARN SWALLOW (*Hirundo rustica*)

Among the remains of small birds in the upper mastaba tomb, I spotted one humerus with the very typical morphology of swallows, measuring about 15.6 mm and comparable with its homolog in the common Swallow or Barn Swallow, which is still an often seen resident of Egypt. Representations of the Swallow are rare in Egyptian art, although it is said to be associated with a minor deity connected with the Theban necropolis and with the goddess Isis. Kessler (1989) records mummies from Achnim and Manfalut. The Elkab find is no doubt derived from an animal visiting or nesting in the mastaba or a prey animal of an owl.

HOUSE SPARROW (*Passer domesticus*)

Among the remains of small birds from the shaft and both tombs of the mastaba, cranial and postcranial remains compare well with House Sparrow in the collections in Ghent and Munich. Among the upper tomb remains two co-articulating series of phalanges of legs were found. No doubt most of the remains are derived from birds taken by an owl, but perhaps House Sparrows also visited the mastaba. The House Sparrow is an abundant little bird of Egyptian towns and villages, but it has been recorded only from Tell Maskhouta. Until now, it has not been found in the mummified avifauna. It is also very rare in the art of Ancient Egypt, but a commonly represented hieroglyph.

BROWN-NECKED RAVEN (*Corvus ruficolis*)

Some 13 postcranial remains from the mastaba shaft derive from a medium-sized corvid, identified with the aid of the IPG collection. The preservation indicates clearly that these remains are derived from mummified animals, representing at least three individuals. An incomplete tibiotarsus from the surface near the mastaba shaft is probably also derived from the mastaba. One carpometacarpus from Tomb 240B, chamber 1 completes the collection.

scapula,	GL:	±45	
	Lm:	42.1	
humerus,	GL:	72.5	
	Bp:	19.3	
	Sc:	6.0	
	Bd:	15.0	
ulna,	GL:	100.4	
	Bp:	11.5	±11
	Sc:	4.9	
	Did:	9.7	
carpometacarpus,	GL:	56.0	57.4
	Bp:	10.8	11.9
tibiotarsus,	GL:	99.0	
	Dp:	13.6	
	Sc:	4.3	
	Bd:	9.0	

The measurements indicate birds somewhat larger than Belgian Carrion Crow (*Corvus corone corone*) in the Ghent comparative collection and can no doubt be attributed to the Brown-necked Raven, a common resident breeder of open country in Egypt. The Egyptian Carrion Crow, *Corvus corone sardonius* is said to be quite small in comparison with the northern forms of *C. corone*. Easily recognisable because of their black and grey coat, these crows flock around human settlements and came to feed on food put out by the author on the terrace of the Elkab excavation house. Mummies of these birds have been tentatively identified from Tuna-el-Gebel and from Saqqara, but the Brown-necked Raven is not among the known mummies. Bone finds of this corvid are known from predynastic Maadi and from Elephantine. Corvids, apparently with a black coat, are fairly common in Egyptian art, mainly in comical situations.

NOT IDENTIFIED BIRDS

Such remains occur sporadically in the samples from the shaft and tombs of the mastaba and elesewhere. They include mainly elements of smaller birds in the size range of thrushes etc. and smaller passeriform birds and a few other not diagnostic remains of larger birds. Lack of comparative material and difficulties to deal effectively with the skeletal elements of smaller birds precluded further identification. Such creatures are well represented in recent regurgitation pellets and carnivore faeces collected on the necropolis.

DWARF SHREW (*Crocidura nana*)

One incomplete mandible found from the mastaba shaft fill (22-23 m) represents a diminutive shrew. Another mandible was seen in the microvertebrate sample of the lower tomb. The length of the molars in the shaft specimen is approximately 3 mm, establishing clearly that the find represents the Egyptian Dwarf Shrew, originally described from mummified animals found in Thebes, as *Crocidura religiosa* for which a later, more valid name would be *C. nana* (Osborn & Helmy, 1980: 78). Apart from this very small shrew, other larger shrews have been identified in mummified material. In Kessler (1989: 34), these are all attributed to *C. flavescens deltae*, but possibly other shrews may also have been embalmed. Anyhow, the identity of the Egyptian shrew mummies needs not to be dealt with here: the Elkab finds are no doubt part of the micromammalian fauna in the shaft as prey animals of predatory birds or as animals trapped in the shaft.

BATS, INCLUDING GEOFFROYS TOMB BAT (*Taphozous perforatus*) AND TRIDENT HORSEBAT (*Asellia tridens*)

Some remains of skulls, mandibles and long bones in the upper mastaba tomb represent four bat species; a few other remains come from the mastaba shaft. Limited access to comparative material and good illustrations allowed but incomplete identifications. The largest humerus in the tomb (L: 35.2 mm) compares well with the specimen from Tuna-el-Gebel in the IPG collection, identified as *Taphozous perforatus* (Boessneck & von den Driesch, 1987: 198). A fragment of a large skull compares favourably with illustrations of the skull of this tomb bat (Qumsiyeh, 1985: 25). Five fragmentary skulls and some mandibles are comparable with their homologs in *Asellia tridens*, also from Tuna-el-Gebel (Qumsiyeh, 1985: 44; Boessneck & von den Driesch, 1987). As their name suggests, tomb bats are frequently encountered in abandoned tombs and other structures; the same can be said about Trident Horsebats. The Ancient Egyptians classified bats together with birds as animals of the air, but the creatures occur only sporadically in their iconographic bestiary. Remains of a Mouse-Tailed Bat, *Rhinopoma microphyllum*, have been found associated with a mummy of a Barn Owl (*Tyto alba*) from Dashur (Batrawi, 1948), but bats are not known as separately mummified animals. The Elkab finds are no doubt remains of bats roosting in the upper part of the mastaba. The bat finds from Tuna-el-Gebel belong to the same taphonomic category of intrusives. Such intrusive bats have also been collected from sieved sediment samples at Tell el-Mashkuta, including *Taphozous* and a pipistrelle bat.

GREATER GERBIL (*Gerbillus pyramidum*)

A few fragmentary skulls and some mandibles among the larger rodent remains from mastaba structures represent a gerbil, comparable in size and morphology with material of Greater Gerbil in

the Ghent comparative collection and matching the description given by Osborn & Helmy (1980). The upper cheekteeth have an alveolar length of 4.8-4.9 mm. The Greater Gerbil is widely distributed in Egypt, especially along the Nile Valley, where it lives in sandy areas. As other gerbils, it is a burrowing animal, coming out of its burrow to forage at night. Gerbils have been recorded in some sites, as intrusives, attracted by human offal as I have witnessed several times in archaeological camps, or as victims of predators, especially owls. No doubt, the tomb finds derive from regurgitations pellets left by owls. A tibia co-articulating with tarsals and distal leg elements held together with mummified tissue in the shaft, represents probably a natural mummy of a greater gerbil that fell in the shaft. Gerbils have not yet been found among the mummified fauna of Ancient Egypt.

NILE RAT (*Arvicanthus niloticus*)

Numerous remains of a larger murid occur in the upper tomb of the mastaba; comparable remains are much less frequent in the shaft and the lower tomb. I found comparable remains in recent regurgitation pellets and recent canid coprolites on the necropolis. The mandibles, upper jaws and fragmentary skulls compare well with comparative material in the Ghent laboratory and the description by Helmy & Osborn (1980). The Nile Rat is widely distributed in Northern Africa and common along the Nile in Egypt and lives in close proximity of human structures, burrowing in almost any damp area under vegetative cover. The animals are active at day as well as at night. They are known from various prehistoric and later sites in Egypt as intrusives (Boessneck, 1988: 62; Gautier, 2001), no doubt attracted by human offal or as a prey animal, especially of owls. Boessneck (1988) found remains of the species in mummified birds of prey, either from Gizeh or Kom Ombo; these had previously been misidentified as Brown Rat, *Rattus rattus alexandrinus*. As in the case of already recorded micromammals, the numerous Elkab finds derive from regurgitation pellets of which part fell in the shaft.

HOUSE MOUSE (*Mus musculus domesticus*)

The largest number of rodent remains, mainly in the upper tomb of the mastaba and much less frequent in the shaft and the lower tomb is derived from small murids. The skull and mandible remains compare well with material of House Mouse, *Mus musculus domesticus* in the Ghent comparative collection and fit, as far as can be seen, the description of this commensal under the label *Mus musculus praetextus* in Helmy & Osborn (1980). The upper cheekteeth have an alveolar length of 3.6-3.8 mm and the M_1 is somewhat larger than M_2 and M_3 together, excluding an identification as Spiny Mouse, *Acomys cahirinus*, another small commensal murid in the Nile Valley; the latter is somewhat larger than the House Mouse, having moreover a relatively smaller upper M_1. The extant commensal mouse of Egypt can be incorporated in *Mus musculus domesticus*. Commensalism of this group would have started with human sedentism of the Natufians in the Near East, from where the group expanded into the Mediterranean basin and Europe during the Neolithic and later prehistory (Auffray *et al.*, 1990; Boursot *et al.*, 1993). Under the label *M. musculus praetextus* House Mouse has been recorded as an intrusive from the Neolithic site Merimda Benisalama in the Delta and from Tell Maskhuta (Boessneck, 1988: 63). Perhaps a rodent held in the mouth of a domestic cat pictured on a ostracon (19-20th Dynasty) represents this commensal.

The House Mouse is widely distributed in Egypt along the Nile and elsewhere; one finds it in human settlements and fields, but also away from human settlements. In nature, these mice burrow and are nocturnal. Near and within settlements, they are less nocturnal and need not to burrow to find shelter and build nests. Possibly some less diagnostic cranial and mandibular remains in the collection represent Spiny Mouse. This murid also lives in close association with people, being even more common than House Mouse in buildings. As the House Mouse, this mouse makes burrows, but appears to be active at all hours of the day, mostly in early morning and late afternoon (Osborn & Helmy, 1980). The foregoing differences in behaviour may explain why Spiny Mouse is not obvious in the Elkab small murid assemblage, which no doubt results from predation by owls. Finds of recent regurgitation pellets and carnivore scats on the necropolis include skull remains attributable to House Mouse.

HARE (*Lepus capensis*)

A single incomplete innominate bone represents this lagomorph in the main collection from

Tomb 120. The preservation of the specimen is comparable with that of other remains at the locus. A fragmentary mandible from Tomb 251 and a proximal tibia from the slope in front of this tomb complete the sample. Kessler (1989: 21) cites a single hare mummy from the cemetery at Deniderah. Houlihan (1995) reproduces a figurine and two wall paintings of hares. Hare is not common among the finds of human settlements.

DOG (*Canis lupus* f. familiaris)

Among the later finds from Tomb 120 a distal femur was identified. Two other finds, both modified by fire occurred in the crocodile sample from Tomb 251. Measurements follow.

femur,	TR.D.dist.:	±27
tibia,	TR.D.prox.:	32.0

Comparison with complete bones of dogs in the Ghent collection indicates these poor remains are derived from dogs of some 50 cm at the shoulders. Mummies of such medium large dogs have been found in several cemeteries; they are generally considered to be pariah dogs comparable to the ones still found today. Co-articulating metacarpals collected on the surface of the lower necropolis probably present such a recent dog of large size. Dogs were not only mummified, burials of pet dogs are also known as well as parts of carcasses in the refuse of settlements. Representations demonstrate the presence of several morphotypes. The many mummified dogs testify to the fact that in late times dogs became connected with the god Anubis whose sacred animal was basically the Golden Jackal (*Canius aureus*).

DOMESTIC CAT (*Felis silvestris* f. catus)
(Plate II, Figures 5, 6 and 7)

Remains of some eleven small felids were collected from the mastaba shaft. The lower mastaba tomb added some remains of three animals to this collection. A few remains collected near the mastaba represent another two animals. Other limited finds come from three tombs and the surface near the mastaba. In total the remains of at least 23 animals are present. Hide pieces and discoloration by bitumen of several finds demonstrate clearly that we are dealing with the remains of mummies. Since long mummies of cats are known from Ancient Egypt and cats were bred in captivity and killed for religious purposes (Lortet & Gaillard, 1903: 21; Armitage & Clutton-Brock, 1981). Some recent finds from Luxor and Tuna-el-Gebel were described by Boessneck & von den Driesch (1982, 1987). Hollmann (1990) describes some bone finds from Elephantine. A special find is the nearly complete skeleton and remains of the fur, stomach and lower intestinal tract found in a Roman building in Quseir. Shortly before death, the animal had eaten several rats (*Rattus rattus*) (von den Driesch & Boessneck, 1983). Most of the cats are of large size and comparable in this respect to the Egyptian wild cat (*Felis silvestris libyca*). It has hence been assumed that the mummies derive from wild as well as domestic cats or cats not yet fully domesticated, on the assumption that size decline with respect to the ancestral species expresses the progress of the domestication process. Size decline is indeed a criterium of domestication but, in my view, applies not well in the case of small mammals. Von den Driesch (1991) argues that in Ancient Egypt domestic females often interbred with wild males.

skull,	condylobasal L.:	82.8	89.0		
	L. P2-P4(L/R):	19.9/20.8	21.0/22.0		
mandible,	L. P3-M1(t):	22.5	20.5	20.5	21.2
humerus,	L.:	112.0			
	Bd:	20.4	20.5		
radius,	L.:	107.0			
	Bd.:	14.5			
femur,	L.:	123.8	106.8	110.4	121.5
	Bd.:	21.6			
tibia,	L.:	127.4			
	Bd.:	15.4			
Innominate,	LAR:	±14.0			

All the measurements fall within the range of large domestic felids, even those of the large long bones in the first column, they compare in size with those of the Quseir cat, probably a male. The difference in size and robustness of the mandible of the large Elkab cat (L.P3-M1: 22.5) and a much weaker mandible (20.5) also from the shaft is striking (Plate II, Figures 5 and 6) and one is tempted to ascribe the first to a wild animal, but its angular process resembles that of domestic cats (Kratochvil, 1973: 21). Moreover, both the mandibles of the large Elkab cat show pathological changes in the region of the P4; such changes are more common in domestic animals than in wild animals. Two subadult femurs from the shaft exhibit also pathological modifications of the proximal end (Plate II,

Figure 7); they are derived from two animals of large size. Summing up, I think that most smaller felid finds from Ancient Egypt can be referred to domestic cats of variable size. This does not exclude the occasional presence of a "good" wild cat. I furthermore wonder whether the marked variability in size of the Ancient Egyptian cats might not reflect different living conditions according to their status in captivity (see chapter 5).

HIPPOPOTAMUS (*Hippopotamus amphibius*)

The finds of this pachyderm are restricted to Tomb 120. Various skull fragments and a fragment of a molar are most likely derived from one adult skull. Fragments of a lower jaw, a scapula, a distal humerus and a tibia represent a very young animal. The scapula and tibia compare well with their homologs in a recent infantile, perhaps neonate, hippopotamus in the IPG collection, but are slightly larger. No doubt, the Elkab bones derived from an animal of comparable age. Hippopotamus disappeared from Egypt in the early 19th century or somewhat later. It is a recurring subject in the iconography of Ancient Egypt, the male hippopotamus being held sacred to the evil god Seth and a mythical enemy of the ruling king. The female hippopotamus was assumed to have a more benevolent nature than the male and associated with the goddess Taweret, patroness of pregnant women, childbirth and fertility. It is not yet totally clear whether hippopotamus should be included in the mummified fauna of Ancient Egypt (see section: "The animal mummies of the rock tombs").

DORCAS GAZELLE (*Gazella dorcas*)

This small wild ruminant is represented by some six fragments of long bone in the sample derived from Tomb 120. One distinguishes easily these remnants from those of sheep or goat by their gracile habitus. They represent at least one individual. In 1987, a fragmentary bucranium with almost complete horncores of a male dorcas gazelle was collected in the fill of Tomb BE1. According to the fieldbook, many other bones apparently all from one individual occurred together with the skull fragment. It may well be that all the BE1 finds represent the remains of one mummified gazelle. Mummified remains of gazelles, no doubt mainly *Gazella dorcas*, have been recorded from several animal cemeteries. Dorcas Gazelle figures frequently in the Pharaonic iconography, in hunting scenes, in files of animal offerings etc., but also as a pet. It was a common game animal in prehistoric sites but occurs also in later sites as a rare game animal.

SHEEP (*Ovis ammon* f. aries) AND GOAT (*Capra aegagrus* f. hircus)

A skull fragment, a proximal metatarsal fragment and a subadult scapula fragment betray the presence of domestic ovicaprines in the backdirt near Tomb 120, but it was not possible to decide whether the remains represent sheep or goat following the diagnostic criteria provided by Boessneck (1969). These finds combine into one individual. An isolated distal moiety of a humerus from the surface shows the angle of the medial epicondyle typical for sheep; the colour of the bone suggests it is derived from a mummy and not an accidental, recent leftover of an eaten animal. More finds were collected in 1999 and 2000 from Tomb 240B. Nine postcranial remains from chamber 1 represent at least three animals, some 21 comparable remains from chamber 2, also add up to some three animals. Among the latter, a much discoloured ovine metacarpus, co-articulating with several distal leg elements, demonstrates clearly that we are dealing with remains from mummies. Tomb 242 yielded a fragmentary distal femur, and Tomb 251 several vertebrae and a distal femur, good for two more animals. A caprine skull fragment with the hornbases from the lower mastaba tomb, most likely a subadult female, completes the collection. It should be noted that most of the remains represent not fully grown animals. No measurements were taken. Mummies of sheep, especially rams, are well known from various animal cemeteries; goats occur less frequently. Sheep and goats are also well represented in Pharaonic art, in domestic and other contexts and the ram was closely connected with several key deities.

CATTLE (*Bos primigenius* f. taurus)

About seventy remains were identified in the backdirt around Tomb 120, including elements of the head, the backbone and the legs. Some dorsal and lumbar vertebrae could be made to co-articulate. The finds combine into three individuals. Two

lower M3 with respectively moderate and heavy wear establish the presence of a young and a old adult in the collected material which consists almost exclusively of bones attributable to almost fully grown or fully grown animals. A scapula and a femur remnant may derive from one juvenile. The miscellaneous collection includes a few surface finds and several finds from tombs. Among these, special mention can be made of more or less complete remains from Tomb BE6 and BE22 of two frontlegs, respectively of a subadult and a younger animal. In Tomb BE27 remains of a subadult frontleg and a subadult femur were collected. In the mastaba shaft (20-21 m), the incomplete remains of two frontlegs of a calf occurred. A immature atlas represents another calf in Tomb 240B, chamber 2. In the archaeological sediment at the north-eastern corner of the mastaba a large fragmentary horn was collected. Some measurements follow; s indicates a subadult specimen.

horn,	TR.D. max. as preserved:	±63		
	TR.D. min. id.:	±52		
	L. outer curve id.:	±340		
humerus,	L.:	±310s		
	Bd:	72.5		
radius,	L.:	±290s	±295s	
mc,	L.:	±200s	±214s	
	Bd:	53.5	64.0	
femur,	Bd:	72.5	79.5	85.5
tibia,	Bd:	55.5		
calcaneum,	L.:	132.5		
Ph.1,	L.:	61,0		
	Bp:	25.5		
	Bd:	24.8		

The horn is clearly derived from a longhorn. The height at the withers based on the subadult long bones and estimated following von den Driesch & Boessneck (1974), suggests animals attaining statures between 125 and 130 cm. As to the transverse diameters of the long bones and the few other measurements of smaller bones, comparison with the extensive measurements on the Iron Age cattle of Manching (Boessneck *et al.*, 1971) suggests animals in the upper range of the latter bovids, that is, animals of at least some 110 cm to 125 cm at the withers. On the basis of the foregoing, we can attribute the finds to the slender legged longhorn cattle of Ancient Egypt, labeled *Bos africanus* in the older literature. According to Boessneck (1988: 69), the height at the withers of this bovid varied between about 120 and 150 cm, as a result of marked sexual dimorphism and the presence of castrated animals, cows attaining a height between 120 and 140 cm, male animals 135 to 150 cm. Most likely both cows and male animals are present in the collection, for the calculated sizes concern animals not having yet attained full stature. As to the horn, its size suggests that it derives from a male animal.

Mummies of bulls, cows and calves are well known; a famous, well studied example is the "Münchner Ochsenmummie", a large castrated male, now in Munich but originating from the Saqqara serapeum (Boessneck, 1987). Cattle is often represented in the iconographic bestiary of Ancient Egypt and its religious and economic role was prominent already in late prehistoric times, as indicated by the bone finds and the late cattle tumuli of the Late Neolithic at Nabta, Western Desert (Applegate *et al.*, 2001; Gautier, 2001).

TRACE FOSSILS

The animal trace fossils found consist of coprolites well represented in the upper mastaba tomb and less frequently in the mastaba shaft and regurgitation pellets in comparable relative quantities in the same contexts.

Two types of coprolites have been distinguished, but as the coprolites are quite variable, more than two species may have left these ichnofossils. The first type consists of loosely coiled, brownish solid strings (maximum diameter ca. 3 mm) containing fibrous vegetable matter and apparently undigested seed fragments. A herbivorous bird no doubt produced these catabolic fossils and the Rock Pigeon nesting in the upper tomb comes to mind. Recent faeces from Belgian domestic pigeons, adduced for comparison, did contain but a few "half-failed" coils of somewhat smaller diameter in a lumpy mass. However, the form of avian coprolites varies markedly with the available food (Bang & Dahlstrom, 1973) and the coiled coprolites are attributed to the Rock Pigeon.

The second coprolite type consists of sinuous, dark brown solid strings (maximum diameter ca. 2.0 mm) up to about 5 cm long. They contain fragments of chitin and were produced by an insectivorous terrestrial vertebrate. According to my colleague Dr. D. Van Damme (pers. comm.) geckos or some other lizard group are responsible for these ichnofossils.

The regurgitation pellets are oblong ovoids, measuring at average 55 mm with a diameter of 25 to 30 mm; originally the pellets were perhaps somewhat larger as shrinkage due to natural mummification may have occurred. They contain remains of the small rodents recorded, some other micromammals, small birds and beetles. These pellets are too large to have been produced by a small owl nor are they attributable to the Barn Owl, which produces normally subspherical pellets (Bang & Dahlstrom, 1973: 193). We can also exclude the Short-eared Owl, which is a winter visitor to Egypt, normally nesting on the ground (Hollom *et al.*, 1988). Thus we are left with the Eagle Owl, *Bubo bubo*, as the culprit. This owl produces large elongate pellets (Bang & Dahlstrom, 1973), but Andrews (1990: 188) illustrates small pellets of Eagle Owl measuring about 50 by 25 mm. Also, Hollom *et al*. (1988) note that the Eagle Owls of Africa and the Near East may attain but about 60% of the size of its European relatives; their pellets are most likely also smaller than the sausages illustrated for the European Eagle Owl. The Eagle Owl occurs in the mummified avifauna of Acient Egypt; Boessneck & von den Driesch (1987) found it in Tuna-el-Gebel and comment on the small size of the animal, justifying the subspecific label *B. b. ascalaphus*, used for the North African Eagle Owl. The Eagle Owl appears to be a quite voracious, opportunistic feeder and according to Andrews (1990) its diet in Northern Europe revealed small mammals (60%) up to the size of hare, birds up to the size of geese (about 36%) and some frogs, fish etc.; even small insects are taken. Larger animals may be skinned, plucked and dismembered and only partially ingested. The Eagle Owl may nest on the ground but prefers stony hollows. It would hence not have shied away from using the upper tomb in the mastaba.

We can add here the traces left on the bones resulting from human intervention as a special trace fossil category (Gautier, 1993). These traces have already been recorded with the descriptions of the remains and consist mainly of discolorations due to the mummification process and the effects of burning on the crocodile remains from Tombs 239 and 252. The cutmarks on the humerus of a Pink-backed Pelican represent another anthropogenic trace fossil.

Special mention has to be made of a left and a right astragalus of sheep or goat associated with the mummy of a child in Tomb BE18 dated to the 18th Dynasty; this tomb also contained some pawns. The mesial and lateral side of the left astragalus have been partially flattened, the right specimen does not show such modifications. These astragali are no doubt game pieces as have been found in many contexts. I know of such finds from Mleiha, Sharjah Emirate, dating from the third or fourth century of our era, a Gallo-Roman settlement and a 17th century abbey in Belgium (Gautier, 1993; Gautier & Van Neer, 1999).

TAPHONOMIC GROUPS

Faunal samples from settlement sites can generally be divided into some five taphonomic groups: consumption and workshop refuse, leftovers of not used carcasses and reworked, penecontemporaneous and later intrusives, i.e., remains of animals not brought to the site by people or brought there unintentionally (Gautier, 1987). The Elkab necropolis calls for the application of other taphonomic groups and the Elkab fauna can be divided into mummified animals (MU), victual mummies (VM), other grave goods (GG), articles of adornment (AA) and intrusives (IN). The abbreviations between brackets are used in Table 1 to specify the taphonomic category or categories of each animal group encountered or the most likely attribution. As to the notes on the various animals found indicate, most of the remains derive beyond doubt from mummified animals and most of these or related forms have already been recorded elsewhere as mummies. An exception, already discussed in the paper on Tomb 120, is Verreaux's Eagle, but this bird fits well in the gallery of mummified birds of prey. Some finds have been added tentatively to the mummified fauna as mummified remains erroneously attributed to a sacred animal. The Soft Turtle carapace remains may have been mistaken for leftovers of crocodiles, the incomplete humerus of a White Pelican for a remnant of a large vulture, as the author did during the preliminary sorting of the remains, while the two remains of Arabian Bustard fall in the size range of the Egyptian Vulture and medium sized falconiform birds. As already pointed out, the named turtle and pelican have not yet been recorded among the mummified fauna; they also are not known as funerary food gifts. Mummies of incomplete animals or combining remains of different species are not uncommon and Boessneck & von den Driesch (1981) record several examples from the Valley of

the Queens. At Elkab, Tomb 240B, chamber 1 yielded a mummy of a Sacred Ibis leg (see also Pahl, 1986).

As to the hippopotamus remains, the question whether or not the Ancient Egyptians embalmed this heavy-weight was addressed in the paper on Tomb 120. It would appear that the Ancient Egyptians were technically capable to perform the operation, since they did not hesitate to mummify cattle and large crocodiles (Behrmann, 1996). Mummies of hippopotamus have not been documented, but Wilkinson (1878: 259, 295) writes that such mummies have been found at Thebes. Behrmann (1996) refers to "Nilpferd-Bestattungen" or "hippopotamus burials" at Qau (19th Dynasty) at Matmar (Ramesside period), but these consist of hippopotamus bones, in one case said to be mineralized and therefore fossil, together with objects made of ivory from hippopotamus and elephant. At Buhen several hippopotamus skeletons would have been deposited in a building (19th Dynasty?) next to a temple. Apparently hippo remains received special treatment during the New Kingdom, not necessarily in the form of mummification. Such may have been the fate of the Elkab hippotami. However, we are dealing with the head of an adult and with a baby. It is unquestionably easier to embalm a head or a young of hippopotamus than a complete adult and I have added tentatively the hippopotamus finds to the mummified fauna. Behrmann (1989) draws the attention to the possible mythological relations between the vulture goddess Nekhbet and the hippopotamus.

Victual mummies consist of entire birds (geese, pigeons, dove) or joints of meat of cattle or domestic ovicaprid, put in graves as food gifts. Various observations suggest that in the case of livestock frontlegs were preferred (Boessneck, 1989: 72; Ikram, 1995; Dreyer *et al.*, 2000). Tombs BE6, BE22 and BE27 yielded more or less complete frontlegs of younger cattle, the mastaba shaft two frontlegs of a calf. These finds suggest that at least part of the cattle remains represent victual mummies. The same might in the case of small livestock, but no separate finds of frontlegs have been found. In Tomb 240B, chamber 2, an ovicaprid scapula was collected with woven tissue adhering to its mesial blade; it may combine with a metacarpus and co-articulating distal elements and thus represent what is left of a preferred victual mummy. In Table 1, the cattle and small livestock remains are listed as mummies and victual mummies.

The category "grave goods" includes no doubt the two ovicaprid astragali associated with the child mummy in Tomb BE18. It includes very probably also the distal humerus of a Pink-backed Pelican with cutting traces, already described in the publication of the fauna from Tomb 120. I have interpreted it as part of a cut wing used as a fan. The archaeological record does not include such items, but fans in the form of a larger bird's wing are known from representations of the First Intermediate Period and the Early Middle Kingdom (Fischer, 1977). The bone derives from a left wing. American natives seem to have preferred left wings, because they fit the right hand better (Gilbert *et al.*, 1985: 4). The larger bivalve finds are no doubt receptacles, perhaps for cosmetics. As to the category "articles of adornment", it comprises but the cowreys and the *Nerita* as remnants of stringed shells, worn by some of the buried people.

Intrusives have been collected mainly in the mastaba structures. These remains include insects, anurans, lizard (coprolites), small birds, Eagle Owl (regurgitation pellets), Rock Pigeon (bones, eggshell, coprolites), dwarf shrew, bats and rodents. Animals got trapped in the shaft or were killed by the Eagle Owl roosting in the upper chamber as shown by its regurgitation pellets. The Rock Pigeon also nested in the upper tomb, as shown by its eggs. In fact, the intrusives in the upper tomb formed a layer covering part of the floor. This "mat" proves beyond doubt that the tomb lay open for some time during its use (see section: "The mummies of the mastaba"). Most of the mentioned intrusives are not known or poorly represented in the mummified fauna from Egypt, but some of the Elkab finds show evidence of mummification attributable to natural causes.

THE ANIMAL MUMMIES OF THE ROCK TOMBS

The recovery of animal mummies from the Elkab necropolis does not come completely as a surprise. Capart (1940) interprets a richly decorated limestone trough from Elkab, now in the collections of the Egyptian Museum, as a vulture coffin. De Meulenaere (1969) reviews the evidence that at Elkab the worship of the crocodile god Sobek was coupled with that of the vulture goddess Nekhbet. Remains of mummified crocodiles were still present scattered near the rock tombs of Elkab at the end of the 18th century. It is also rea-

sonable to assume that the oblong box-like cavities of varying size in the flanks of the necropolis and in the walls of some of the rock tombs were hacked out to accommodate embalmed crocodiles. Tombs 242 and 251 demonstrate clearly that certain tombs were reused as repositories preferentially for crocodiles. Tombs 120, 239 and 240B appear to have accommodated preferentially birds, especially vultures and other birds of prey. Not located in the rock necropolis is locus 42 of the catalogue by Hendrickx & Huyge (1989: 15, Plate II), excavated in 1964 by the Egyptian Antiquities Organization. There, sixty jars with many mummies attributed to vultures were collected from the burial chambers of a mastaba-like structure. This site lies some 120 m north-east of the northern half of the northwest wall of the mudbrick enclosure probably dated from the 30th Dynasty; the temple of Nekhbet, the tutelary goddess of Upper Egypt, within this enclosure was in use from the 18th to the 30th Dynasty.

An attempt to obtain a radiocarbon date from a rock tomb with animal mummies did not succeed. From a more or less complete skeleton of a Sacred Ibis in Tomb 240 only the glue fraction could be extracted providing an infinite date (Dr. J. van der Plicht, Groningen, *in litt.*). Gautier & Hendrickx (1999) use the restricted late ceramic finds attributable to Tomb 120 to date its reuse as a depository for embalmed animals to the Greco-Roman period. Burials of animal mummies go back to the Middle Kingdom, but the development and complex organisation of the practice and the resulting cemeteries with extensive and diversified animal mummies would be typical of the Greco-Roman period (Kessler, 1989). On the strength of the foregoing, the reuse of the tombs in the Elkab necropolis is dated to that period. However, the suggestion that a room would have been added to Tomb 120 to accommodate mummies (Gautier & Hendrickx, 1999) appears in retrospect questionable. Such an addition would point to a very intensive re-use of the neocropolis. In my opinion, more surface finds would in that case testify to such intensive use.

Kessler & El-Hakim Nur El-Di (1999) (see also von den Driesch & Kessler, 1994) react against the still widely repeated scenario according to which the tremendous amounts of animal mummies encountered in the various animal cemeteries result from remains brought to the religious centers by pilgrims or the intensive confection and sale of mummies as offerings or ex votos. The latter would explain the existence of pseudo-mummies, faked mummies or imitations (examples see Francot *et al.*, 1999: 26, 28, 29; Pahl, 1986). However, the care, use and disposal of sacred animals or their remains appears to have been completely in the hands of the priests and their associates, who had access in principle to three categories of sacred animals. Following Kessler & El-Hakim Nur El-Di (1999) I summarize these as follows: (1) exemplary individuals enacting the life cycle of a particular tutelary god and kept near the cultic locus concerned; (2) similar individuals also kept near cultic loci, playing temporarily roles in cultic events or used as sacrifices; (3) animals in protected breeding places, from which individuals for category one or two were selected. The three categories yielded animals and animal remains for mummification. Category three can be exemplified by the protected breeding grounds of Sacred Ibis; several thousand birds nested in these places and their attritional mortality provided abandoned eggs, nestlings and older animals to be deposited as mummies either of complete individuals, clustered remains and incomplete remains. For falcons and other predatory birds, Kessler & El-Hakim Nur El-Di (1999) do not exclude the existence of aviaries, but add that remains may also have been collected outside cultic areas. Keeping animals in captivity often leads to pathological conditions, partially detectable on skeletal remains. Most impressive are the many pathological changes of baboons (Boessneck & von den Driesch, 1987; von den Driesch, 1993; von den Driesch & Kessler, 1994), mainly due to poor nutritional and other conditions in captivity and Kessler & El-Hakim Nur El-Di (1999) interpret a small stone structure at Tuna-el-Gebel as a cell in which a baboon was kept. At Elkab, one tarsometatarsus of a Sacred Ibis exhibits changes interpretable as caused by an incomplete fracture. It probably did not much incapacitate the animal in the protected cultic environment. An incomplete fracture of its humerus may not have been a major problem for an Egyptian Vulture from Tomb 240B, chamber 1, but the not reduced fracture of a femur of another small vulture in chamber 1 appears quite problematic. So would several of the healed fractures recorded for the larger vultures (see section on these birds). Several pathologies on the vulture bones may hence indicate that the animals involved received special care in captivity; perhaps they were given shelter after they were found seriously hurt.

Summing up, some rock tombs in the Elkab necropolis appear to have been reused as deposito-

ries for animal mummies during the Greco-Roman period, with cultic focus on large vultures associated with Nekhbet, the tutelary goddess of Upper Egypt, and on crocodiles associated with Sobek.

THE MUMMIES OF THE MASTABA

Animal remains collected from the shaft and lower chamber in the mastaba, and nearby the mastaba, showing undeniable evidence of embalmment, include an Egyptian Vulture, a falcon some twenty Barn Owls and more than a dozen cats; among the latter two show pathological changes.(Plates II, Figures 6 and 7). This assemblage is clearly different from the vulure-crocodile assemblage in the necropolis and I assumed originally that a shift in cultic practices during the Greco-Roman period accounted for the observed differences in composition and location. Two radiocarbon dates on mummies from the mastaba came as a surprise.

Egyptian Vulture, humerus, fill lower chamber: 3040±60 bp (GrA-21307) or 1440-1000 BC (95.4% probability).

Barn Owl, various postcranial bones, fill shaft: 2945±45 bp (GrA-22815) or 1310-1000 BC (idem).

As to the history of the mastaba, it appears to be complex. The available data on it (Huyge, 2000) integrating the dates on the animal mummies, summarize as follows (Figure 2).

Lower and original grave chamber at -23 m: burial during the 3rd Dynasty documented by remnants of the original funerary equipment. Looting. Two disarticulated human skeletons in later fill, one radiocarbon date (GrA-12373) calibrated to 1410-1010 BC, that is, New Kingdom or early Third Intermediate Period. One date on avian mummy: 1440-1110 BC (see above).

Shaft, fill with intrusive and animal mummies at several depths, one radiocarbon date on Barn Owls: 1310-1000 BC (see above).

Shaft, at -21.5 m: two still articulated skeletons of children, associated with a coffin lid of New Kingdom or Third Intermediate period (21st Dynasty), one skeleton dated (GrA-12371) and calibrated to 1130-820 BC, that is, late New Kingdom or Third Intermediate Period.

Upper Chamber: originally probably store room for funerary offerings associated with the 3rd Dynasty burial in the lower chamber. Later appropriated for burials shown by the seven burials found during the excavation. Burial 7, of the lower and first layer of burials, dated to 1010-820 BC (GrA-14027).

The original use of the lower chamber and its subsequent looting are firmly established. What happened later, is in my view, most parsimoniously explained by accepting three periods of reuse of the upper chamber, with disposal of the two earlier burials in the shaft (human skeletons in the lower chamber and the lower shaft). The archaeologists observed no “mat” of intrusive small vertebrates and associated ichnofossils under burial 7 in the upper tomb, but such a layer occurred under the coffins next to it. For some time the tomb lay open and Eagle Owl, Rock Pigeon an other creatures could build the intrusive mat. How long the tomb stayed open can not be established. The “mat” only confirms that the burials were spaced in time.

All the foregoing does not much to explain the animal mummies. They date from the same general period as the human skeletons in the lower chamber and the shaft and testify to the practice of animal mummification at Elkab already during New Kingdom times or the early Third Intermediate Period, at a much earlier time than the Greco-Roman use of the necropolis as an animal cemetery. Remains of animal mummies from the surface near the mastaba indicate that probably the mummies were originally deposited in the superstructure of the mastaba or what was left of it at the time. Other and better documented early animal mummies wil no doubt help to understand better the early mummies of Elkab.

THE BURNED CROCODILE MUMMIES

As said, many remains of the crocodile tombs exhibit evidence of prolonged exposure to fire: brownish to white discoloration, warping, fissures, shrinkage. Some remains also show greenish discolorations and a enamel-like deposit, sometimes with vacuolar aspect, which have been identified as the result of the “boiling” of NaCl, a salt likely used during the mummification procedure (Dr. P. De Paepe, Ghent, pers. comm.). Other more bluish discolorations point to the original presence of bronze objects. Crocodile remains, representing at least 19 individuals but probably derived from

many more animals, and modified by prolonged exposure to fire, have also been recorded from Al-Ma'abda, north of Asiut and famed as a crocodile cult centre. The remains occur in a shallow pit dug in the floor of a temple area. Remnants of a fire with comparable remains were also discovered. Other remains derive from crocodiles modelled in stucco, bronze jewellery and the wooden beds on which the mummies rested. The mummies would have been robbed of their valuables, hacked into pieces, burned and in part disposed off in the pit (Dr. A. von den Driesch & Dr. J. Peters, pers. com.). The Elkab and Ma'abda finds suggest a destructive behaviour, intentional and repeated, but its significance and dating are far from clear. My first guess was that the destruction of the crocodiles might be a mode of Coptic or later iconoclasm focusing on crocodiles as malevolent heathen idols or symbols. Already during the Pharaonic period the attitude towards crocodiles was markedly ambivalent. However, a more prosaic explanation can be proposed. Lortet & Gaillard (1907: 295-299) studied the many crocodiles from Kom Ombo. These include newly hatched to very large individuals, but all were "mummified" by plunging them in hot bitumen. As a result a thick coat of this substance covers the animals. The crocodiles from Esna (Latopolis) and some other unknown origin, studied by the same authors (idem 1903: 181-183) are small and most of them survived for posterity through a bitumen bath; only a few specimens received a more sophisticated treatment involving natron. I imagine that crocodiles do not respond well to the usual mummification treatment and that bitumen was often applied generously. If so, the Elkab crocodile mummies may have provided fuel for fires lit by people using the crocodile tombs for shelter in post-Pharaonic times.

CONCLUSIONS

The faunal analysis at Elkab focused on finds from several tombs and the surface of the necropolis, and from the mastaba on top of the necropolis. The finds from the tombs prove undeniably that tombs were used as depositories for animal mummies, either mainly large vultures or crocodiles (see Table 1). The vultures are associated with Nekhbet, the tutelary goddess of Upper Egypt, the crocodiles with Sobek. Among the birds, a few Sacred Ibis and vultures show pathological changes indicating that special care was taken of these birds. Verreaux's Eagle is new to the ancient avifauna of Egypt and as a mummy. Soft-shelled Turtle, White Pelican and Arabian Bustard may have been mummified as a result of mistaken identities. The use of the necropolis as an animal cemetery is dated to the Greco-Roman period by some ceramic finds, but no radiocarbon dates are available. It is also not clear why the crocodile remains in the crocodile tombs have been exposed to fire. The fill of the lower chamber and shaft of the mastab also contained animal mummies, but the spectrum is different, comprising smaller predatory birds, Brown-necked Raven and domestic cat, of which two individuals show pathological changes. According to the radiocarbon dates, these animals have been mummified during the Middle Kingdom or early Third Intermediate Period, when the superstructure of the mastaba or what was left of it may have been used as a depository for embalmed animals. During the same period the upper chamber of the mastaba appears to have been appropriated for human burials. It would have been reused at least three times with disposal of the earlier burials in the shaft. Thus human skeletons in the shaft and in the lower tomb became associated with animal mummies from the superstructure of the mastaba. Intrusive fauna and ichnofossils (see Table 1) have been found mainly in the subterranean structures of the mastaba. These intrusives formed a layer on the floor of the upper chamber not extending under the coffin with a mummy dated from the Third Intermediate Period. After deposition of this coffin the chamber lay open before six other burials were added. Other finds of the necropolis and the mastaba can be grouped as victual mummies, grave goods and articles of adornment. The exact significance of the early animal mummies in the mastaba may become clear when other such early mummies become better known.

ACKNOWLEDGEMENTS

I thank my colleagues of the Belgian Archaeological Mission to Elkab 1996-2000 for their help in the field, fruitful discussion and the xeroxes of various papers. Dr. P. Grootaert (Royal Belgian Institute of Natural Sciences, Brussels), Dr. W. Van Neer (Royal Museum of Central Africa, Tervuren), Dr. J. Peters and Dr. A. von den Driesch (Institüt fur Paläoanatomie und Geschichte der

Tiermedizin, Munich) helped with the identification respectively of the insect remains, the fishes and the birds. Photographs were provided by the mission and by my temporary collaborator, licentiate B. De Wilde, who also composed the plates. Licentiate T. Vandenbroucke made the computer drawings of the map and the mastaba. The work at Elkab was sponsored by the Fund for Scientific Research-Flanders and the Belgian Federal Ministry of Research Policy.

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