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Quaternary mammals and archaeozoology of Egypt and the Sudan: a survey

The presently known data on Quaternary mammals and archaeozoological faunal assemblages from Egypt and the Sudan (mainly from the Nile Valley) can be conveniently grouped as follows:

1. Older finds

Quaternary mammals, sometimes associated with traces of human activity, have been recorded in the Nile Valley since the second half of the last century. Thus Falconer (1864; 1865) described a large maxilla of *Hippopotamus amphibius* from alluvia found near the ancient temple of Kalabsha above the First Cataract. An educated guess on the basis of the geology of the area suggests a Late Quaternary age for this find (see section 3 of this review). Another find, not recorded in the valuable bibliography of African fossil mammals published by Hopwood and Hollyfield (1954) but noted by Bate (1951), concerns a fossil buffalo skull found near Khartoum. It was found "half an hour" northeast of that city, apparently in fluviatile deposits and was associated with a large hippopotamus jaw. Vacek (1876) compared it to *Bubalus antiquus* (= *Pelorovis antiquus*, cf. Section 2), but according to Bate (1949 a) it could be conspecific with her *Homoioceras singae*. If this interesting specimen has not been lost, a new study may be rewarding.

An intriguing find was recently "rediscovered" by Midant-Reynes and Braunstein-Silvestre (1977) who drew our attention to the vicinity of Helwan railway station, south of Cairo, where Mook (1880) excavated a Palaeolithic site last century which yielded the remains of hyena (*Crocuta crocuta*), equid (*Equus africanus*, wild ass), hartebeest (*Alcelaphus buselaphus*), an unidentified larger antelope and a camelid somewhat different from the domestic form known in the Old World (Rutimeyer, 1880). The camelid material, possibly conspecific with what this author described as *Camelus thomasi* (Gautier, 1966) should be re-studied, but its whereabouts are not known at this moment.

Fossilized bones collected from the alluvial deposits near Wadi Halfa, in lower Nubia, described by Lydekker (1887) include a large bovid and a small upper molar of an equid. In the discussion following Lydekker's paper, fossil remains of deer and large bovids from the same area are also mentioned. The deer fossils are still regularly cited in literature and have acquired an importance not matched by the direct evidence for the existence of this form. Lydekker compared his equine with *E. sivalensis* and *E. stenonis*. Recently Churcher and Richardson (1978) identified it as *Equus* (*Dolichohippus*) *numidicus*, a primitive zebra existing from the middle Late Pliocene into the Early Pleistocene. However, Sandford and Arkell (1933: 38, footnote) considered this tooth as of Late Palaeolothic chronology and certainly not related to such primitive equids as those cited by Lydekker (*ibid.*). Churcher (*in litt.*) agrees that it is very difficult to evaluate its status [1].

A mixed lot of fossils was collected at Khartoum during the construction of the Blue Nile bridge from 20 to 33 m below the water level. According to Andrews (1912), it contained recent species such as elephant, hippopotamus, giraffe and antelope (? *Tragelaphus*), a siluroid fish as well as an extinct proboscidean, represented by a molar fragment. On the basis of the hypsodonty index and the lamellar frequency as deduced from the figure of the specimen, it may be assigned very tentatively to *Elephas iolensis* Pomel, 1895 (cf. Coppens *et al.*, 1978). This species has also been recorded in the southeastern Sudan at Natodomeri (or Natodameri, cf. Maglio 1973 : 37) in the Kibish Formation, the Late Quaternary fluvio-lacustrine series north of Lake Rudolf. It is associated there with an essentially modern African fauna and has been provisionally dated by U-Th method to about 35,000 B. P. (personal communication by R. Thurber in Coppens *et al.*, *ibid.*). *E. iolensis* is possibly also present in the Nile deposit at Tabo near Kerma, in Central Nubia (Coppens, *in litt.*).

In 1927, a small collection of bones was secured by Arkell during the digging of a well in his garden at Kosti, 180 miles south of Khartoum, on the White Nile. Among these were a carnivore canine and an incomplete lower third molar of a large suid. Hopwood (1929) described it as *Hylochoerus grabhami*, but Arambourg (1941; 1949) changed its name to *Mesochoerus grabhami* and was supported by Leakey (1958: 14, Fig. 6). Recently Cooke and Wilkinson (1978) concluded that the specimen may be described as *Kolpochoerus olduvaiensis*, a chronospecies which could have existed from about 2 to 0.6 million years ago or even 0.35 million years ago (Cooke, *in litt.*). In the opinion of this author this identification should be revised.

From a bore in alluvial deposits at Umm Koweika, west of Kosti, Andrew (1948)

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[1] An error has crept into the site list of African fossil equids compiled by Churcher and Richardson (1978 : 388 - 386, Fig. 201); Wadi Halfa (site 93a) does not belong to level 1 *sensu* Joleaud (1933) but to zone 2. To the best of my knowledge there is no second equid find from Wadi Halfa, but such a find is listed as pertaining to zone 2 *sensu* Joleaud. However, this zone refers to finds at Anteapolis near Asiut, in Egypt, described by Parona (1918) (see also section 3 of this review).

records large siluroid fish fragments, fragmentary teeth and reptile and mammal bones, but the age of this material is unknown.

Finally there are the fossil finds from Saggai, about 25 km north of Khartoum. They include molluscs, fish, turtle, crocodile, carnivores, elephant, equid remains, rhinoceros, hippopotamus, a suid, a camelid, giraffe and various bovids as well as a bone harpoon (Cloudsley-Thompson, 1966). They were collected at low water from a small island of gravel-strewn Nile silt and the southern extremity of a large island nearby. Some remains, from the same locality in the Sudan Antiquities Service which I was able to study in April 1981, consist of a rolled fossilized assemblage containing wild mammals as well as probably domestic cattle, perhaps domestic donkey and dromedary. It is certainly derived and of mixed origin, though some remains probably pertain to sites related to Early Khartoum or Esh Shaheinab (cf. excavations at Saggai and Geili by Dr. I. Caneva *et al.*, this volume.). No doubt the fossilisation is due to burial in waterlogged deposits and exemplifies the danger of relying on the degree of fossilisation in predicting age.

2. Abu Hugar and related sites

Rich assemblages from Singa and Abu Hugar, situated 215 and 230 km south of Khartoum respectively, on the Blue Nile, were described by Bate (1951). They were found in deposits now thought to be situated near the basis of the Gezira Clay (upper member of the Gezira Formation, cf. Whiteman, 1971). Abu Hugar yielded the remains of *Hystrix astasobae nov.* sp.; *Equus* sp., rhinoceros (possibly white rhinoceros, *Ceratotherium simum*), *Hippopotamus* cf. *amphibius*, a sivatherine, *Homoiceras singae*, *Oryx* sp., an antelope or caprid (one horncore), *Gazella*, *Crocodylus niloticus* and a freshwater snail. At Singa, the remains of rhinoceros, hippopotamus, a possible hypotragine antelope, an antilope of the size of Grant's gazelle and *Homoioceras singae* were recorded. Singer and Boné (1960) identified the sivatherine from Abu Hugar as *Sivatherium olduvaiense* which, according to Churcher (1978) should be included in *S. maurusium*. According to Churcher and Richardson (1978), the equine of Abu Hugar would be *Equus africanus*, but this identification is based on the geological age of the find (Churcher, *in litt.*). Wells (1963) identified the so-called antelope or caprid as a reduncine (*Cf. Kobus* sp.). Gentry (1978) accepts this identification but points out that *Homoioceras singae*, first described by Bate (1949) is a large form of the African buffalo group (*Syncerus*). The other species included in *Homoioceras* (*H. antiquus* and synonyms, *H. baini*, *H. nilssoni*) represent a different genus now called *Pelorovis*, hence *Pelorovis antiquus* instead of *Bubalus* or *Homoiceras antiquus*. Howell (1978), however, makes a *lapsus calami* and quotes *Pelorovis antiquus* at Singa.

Singa also yielded a fragmentary human skull, originally described by Woodward (1938) as bushmenoid, but Stringer (1979) concludes that its calvarium is pro-

bably derived from a late archaic *Homo sapiens* individual. The Abu Hugar animal remains included a poorly defined assemblage of lithic artefacts which was the object of several debates (cf. Stringer, *ibid.*); its seems to be dated to between 45,000 and 20,000 BP. A radiocarbon date on a crocodile tooth from Abu Hugar assemblage gave an age of ca. 17,300 BP. but the sample is said to be far from adequate (Whitman, 1971: 124).

Simons (1966) described a fossil monkey skull recovered, in 1938, from a clayey deposit in the Gezira Plain near Wad Medani, 1.5 km south of Abu Suheli Gubba. He identified it as *Colobus polykomos abyssinicus*. This form, typical for a canopy forest habitat, occurs today about 450 km to the south of this site. The fossil specimen hence suggests that at least a gallery forest extended as far north as the Wad Medani region during the time of the deposition of the Gezira clays.

3. Late Palaeolithic assemblages (30,000 - 7,000 B. P.)

Faunal remains associated with the Late Palaeolithic artefacts in southern Egypt and the Wadi Halfa area (lower Nubia) have been described by Gaillard (1934; Kom Ombo), Perkins (1965; Wadi Halfa), Robinson (1966; Wadi Halfa), Wendt and Reed (1866; Wadi Halfa), Reed (1969; Kom Ombo), Churcher (1972; 1974; Kom Ombo; see also Churcher and Smith, 1972) and Gautier (1966; 1976 a; Isna, Idfu; 1978; Elkab). Finds from near the ancient temple of Soleb in Nubia, associated with human remains, are probably contemporaneous with artefacts of Late Levalloisian and Upper Palaeolithic tradition and include rhinoceros and giraffe not recorded elsewhere (Coppens, 1971). Near Qau, 50 km south of Asiut in Egypt, bones collected by man in caches during the Pharaonic times were recorded by Sandford (1929; 1934). Most of these derive from the Late Palaeolithic silt outcrops in the area but some more recent specimens (donkey, hippopotamus) are mixed with them. Fossil bones were also reported near Idfu in Upper Egypt, in the Late Palaeolithic silts (Sandford and Arkell, 1931). Some remains from El Hibbah (opposite El Fashin) and Esh Sheikh Timai, near Geziret Shaibah, also belong here (Sandford, 1934).

A critical list of the vertebrates encountered in association with the Late Palaeolithic site includes various fish (mainly *Clarias* sp., cf. Greenwood and Todd, 1978), soft shelled turtle (river turtle, *Trionyx trianguis*), Nile crocodile (*Crocodylus niloticus*), various birds (local species as well as winter visitors, cf. Churcher, 1972; 1974) and a varied group of mammals of which rhinoceros and giraffe from the Wadi Halfa area were already mentioned. Other forms[2] include: wild cat (*Felis libyca*), jackal(s) (*Canis lupaster*; *C. aureus*? *soudanicus* WH; *C. mesomelas*, WH), spotted hyena (*Crocuta crocuta*), striped hyena (*Hyaena hyaena*), bandicoot rat (*Nesokia indica*), porcupine (*Hystrix cristata*), warthog (*Phacochoerus aethiopicus* WH),

[2] Forms recorded in the Wadi Halfa area only, are marked WH.

wild ass (*Equus africanus*), hippopotamus (*Hippopotamus amphibius*), hartebeest (*Alcelaphus buselaphus*), gazelle (*Gazella dorcas* and possibly *G. rufifrons*), barbary sheep (*Ammotragus lervia*), some other antelopes (WH), wild dromedary or camel (*Camelus thomasi*, WH), and *Procavia* (*dassie*, WH). Gaillard (*ibid.*) described *Homoioceras vignardi* as a form related to the North African giant buffalo (*H. antiquus=Pelorovis antiquus*), but the reality of this bovid is questionable. At Qau, *Sus* sp. is recorded, but this is probably a recent intrusive element. A new species of crocodile from the same area is also doubtful.

A mysterious collection found in a tomb near Antaeopolis and described by Parona (1918) should also be included here. About two hundred specimens from a collection of several hundred were identified as *Equus*, *Sus*, *Hippopotamus*, *Cervus*, *Camelus*, giraffe (listed as „*Camelopardalis Giraffa*"), ?*Boselaphus* (near to *Boselaphus prebubalis* Pomel, primitive hartebeest, cf. Gentry, 1978: 556), *Bos*, *Felis*, *Struthio cameles* and other birds, *Crocodylus*, *Trionyx*, *Emyda* and siluroids. If traced back, this strange assemblage will probably be reducible to the one predominantly composed of the already cited Late Pleistocene forms. Joleaud (1933) mentions it as his zone 3 of the so-called St. Prestian age. *Cervus* in this assemblage is based on a fourth upper premolar and an incomplete.

This section can be closed by noting that plant domestication was possibly practised by the Late Palaeolithic people at Wadi Kubbaniya (Wendorf *et al.*, 1979; Wendorf and Schild, this volume; Stemler, *ibidem*) as well as a sophisticated resource scheduling (Gautier *et al.*, 1980).

4. Predynastic fauna from the Egyptian Nile Valley and the Fayum (approximately 7,000 - 5,000 B. P.)

Under this heading the faunal assemblages from the period predating the first dynasty are grouped, in which the following cultural complexes are distinguished: Badarian, Amratian (Naqada I), Gerzean (Naqada II) as well as the Merimde Neolithic and the Fayum A Neolithic (cf. Krzyżaniak, 1977). Our knowledge of these assemblages is rather limited because almost no detailed reports have been published on them (as exceptions, cf. Gaillard, 1934, Toukh; Gautier, 1976 b, Fayum A), while the other well-intentioned efforts in this direction are practically useless (cf. Moustafa, 1952; 1953 a and b; 1955). A critical evaluation of most important refererences was made by Reed (1959; 1960) and Angress and Reed (1962). This writer is now studying the Badarian fauna of El Khattara near Naqada (cf. Hassan, this volume) and also investigated some samples excavated at Merimde Beni Salama. This first hand experience and a critical evaluation of the literature indicate that the faunal assemblages of the Predynastic period are dominated by domestic animals including pig, sheep, goat, cattle and dog. Evidence for the domesticated ass is limited (Peet, 1914; Menghin, 1931) but an Early Dynastic burial containing the re-

mains of domestic asses (Petrie, 1914) corroborates the idea that the domestic form of this animal was also present in the Predynastic times. Wild animals from Predynastic sites include birds, fish, crocodile, turtle, hippopotamus, antelope and gazelle. Quantitative analyses of the faunal assemblages found in different settings and periods would be very useful in evaluating ecological and other changes. This will apparently be soon possible as regards the already mentioned El Khattara fauna and that excavated at Hierakonpolis (Hoffman, this volume).

5. Dynastic fauna from Egypt

Studies on the fauna of dynastic Egypt often focused on pictorial representations of animals or their mummified remains (cf. Lortet and Gaillard, 1909), specific domestic breeds (cf. Pia, 1942) and isolated finds (Jackson, 1934; Ducos, 1971 a and b; Boessneck, 1970; 1975; 1977). There has been a lack of detailed analyses of faunal assemblages from dynastic Egypt with only few exceptions (cf. Boesneck, 1976). These would help to reconstruct palaeoecological and palaeoeconomical changes as well as changes in the breeds of domesticates and to establish the dates of introduction of certain animals. The history of the dromedary in Ancient Egypt has recently been reinvestigated by Midant-Reynes and Braunstein-Silvestre (1977). According to them the dromedary became well known in Egypt only from the Ptolemaic period onwards. The introduction of the horse is discussed by Braunstein-Silvestre (this volume).

6. Early Khartoum, Esh Shaheinab and related sites in the Sudan (?8,500 - 5000 B. P.)

The faunal assemblage of the Early Khartoum site on the Blue Nile described by Bate (1949b) includes land and freshwater molluscs, fish (especially *Clarias* sp.), crocodile, python, monitor lizard, soft shelled turtle, land turtle, carnivores, some rodents, hippopotamus, warthog, various antilopes, buffalo, (black?) rhinoceros and elephant. No evidence of domestic animals was found and it is assumed that the inhabitants of the site were hunters, gatherers and fishermen. A preliminary faunal list of Shabona (about 90 km south of Khartoum, west bank), a site excavated by Clark and associates (Clark, 1973) and compared to Early Khartoum also contains wild animals only: elephant, hippo, giraffe, bovids, warthog, mongoose, reptiles (python) and fish as well as numerous remains of an ampullarid (*Pila* sp.), which may have been eaten. The fauna of Saggai (cf. Caneva, this volume) is now under study and appears also to contain no domesticates.

At Esh Shaheinab, however, the faunal assemblage contains wild animals as well as small livestock (Bate, 1953). This livestock is represented by several horncores

of a small goat with straight horns, a caprovid with larger twisted horns, which Bate hesitates to asign to goat, but which is definitely caprine, and of a horncore fragment very probably from a sheep.

The Early Khartoum tradition has recently been dated by finds of barbed bone points in association with radiocarbon datable materials. It apparently developed in the seventh and sixth millenia B. P. (Adamson *et al.*, 1974). Kadero, another Neolithic site dated to approximately 5,300 - 5,100 B. P., yielded a faunal assemblage predominantly composed of domestic animals and some game (Sobociński, 1977). The domestic animals include mainly cattle, small livestock and possibly dog. The wild animals are now being re-studied and include fish, monitor lizard, hare, rodents, squirrel, wild cat, some other carnivores, hippopotamus, warthog, oribi and hartebeest (Gautier, this volume and in preparation; see also Krzyżaniak, this volume). Another Neolithic site at Geili near Esh Shaheinab, but situated on the opposite side of the Nile, yielded only few animal remains and they include freshwater and land molluscs, fish, monitor lizard, crocodile, python, goat and cattle (Caneva, 1976; 1978).

7. Later Neolithic and historic sites in Nubia

Perkins (1965) described a faunal assemblage excavated from the vicinity of Wadi Halfa and pertaining to the A-Group, but according to Nordström (1972) it belongs to the Abkan site ASG-G-25. It contains catfish, Nile perch, ostrich (eggshell), Egyptian goose (*Alopochen aegyptiacus*), hare, gazelle, large bovid and wild ass. Domestic goat seems to be represented by a single distal epiphysis found in the upper layer of the site and may be Terminal Abkan or intrusive. Another Abkan faunal assemblage was described succinctly by Carlson (1966) and includes fish, hare, an equid, gazelle and remains of a large bovid which could have been domestic cattle – at least some of them. Hence our scanty knowledge does not permit an unquestionable affirmation that the Abkans already were practising animal husbandry though it seems that they may have combined gathering and hunting with pastoral activities.

Faunal remains of the subsequent A-Group are also poorly known. Bietak and Engelmayer (1963) recorded cattle, sheep or goat and ostrich eggshell from Sayala, while Nordström (*ibid.*: 129) published a note by Perkins concerning the remains of *Equus* sp., a canid and gazelle from the A-Group site 303. That the A-Group people were already pastoralists is mainly indicated by the fact that the temper of their pottery contained cattle dung and that their rock art shows longhorned cattle. According to Hofmann (1967), the A-Group graves yield remains of gazelle, crocodile, goat, sheep, cattle and dog. The presumably subsequent B-Group graves are said to contain the same domesticates.

Animal remains from several C-Group burial grounds, dated to the period con-

temporary to the First Intermediate Period and the Old Kingdom in Egypt, were recorded by Perkins (1965) in the Wadi Halfa area who identified these as goat, sheep and cattle. The goats have twisted horns, but a few of the smaller female skulls have horncores almost without the twist, thus very much resembling Bate's dwarf goat from Esh Shaheinab (Bate, 1953). The sheep are of the ammon-type ("*Ovis arie platyura-aegiptica*"), the breed that would have replaced the earlier longlegged breed with twisted horns occurring along the Nile, during the 12th dynasty. Cattle skulls from the C-Group cemetaries were described by Hall (1962; cf. also Huard, 1964). Some remains excavated by Bietak (1966) from a C-Group site at Sayala include caprovids, possibly generuk (*Lithocranius walleri*) and cattle.

Faunal remains from Jebel Tomat, a site located about 60 km north of Kosti, and probably related to Jebel Moya, are briefly recorded as small domestic cattle, small livestock and include some remains of various wild species such as gazelle, klipspringer, bush pig, cane rat, mongoose, monitor lizard, several birds etc. Ampullarid shells (*Pila* sp.) are frequent and may have been used as bait for fishing (Clark, 1973). From a test excavation at Jebel Moya itself Clark (*ibid.*) records cattle and goat bones.

Recently the study of faunal material from Kerma (Middle Kerma, 2000 - 1700 B. C.) has begun (Chaix, 1980). Cattle, small livestock, donkey, dog, possibly domestic pig (!), some rodents, hippopotamus, elephant and some reptiles were identified in food refuse. Materials from the eastern necropolis suggest live burial of small livestock and the burial of a small dog. Cattle bucrania deposited near tombs are also mentioned. A detailed study of domestic animals (cattle bucrania; small livestock) buried in graves of the large Kerma necropolis on Sai Island, about 2.5 km north of Kerma, was made by Jourdan (1980).

Other information from the later sites in Nubia can be found in Hofmann (1967) and their contents clearly indicate the urgent need for detailed archaeozoological research in the Sudan. Such research is well exemplified by a recent study on the faunal remains excavated at Old Meroe (Carter and Foley, 1980).

8. Faunal assemblages from the Western Desert

Archaeozoological sites in the Kharga Oasis reported by Caton-Thompson (1952) yielded a fragmentary bovine tooth and a comparable equine molar associated with the Levalloisian spring mounds, while a tooth ascribed to *Hyaena* cf. *striata* and a gazelle mandible were collected in the Neolithic spring mounds. More Neolithic remains from recent excavations are described by this writer (Gautier, 1980) and these include a large bovid, probably a large breed of domestic cattle and a smaller bovid – either a gazelle or domestic caprovid.

Faunal assemblages from Bir Sahara and Bir Terfawi associated with the Middle Palaeolithic artefacts (Mousterian, Aterian) include jackal (*Canis aureus lu-*

paster), fox (*Vulpes rüppelli*), wild ass (*Equus africanus*), white rhinoceros (*Ceratotherium simum*), warthog (*Phacochoerus aethiopicus*), wild camel (*Camelus thomasi*), giant "buffalo" (*Pelorovis antiquus*), (red fronted) gazelle (*Gazella rufifrons*?), a large gazelle (*Gazella dama*?), a large antlope, a medium sized antlope and turtle (Gautier, 1980).

The Terminal Palaeolithic sites in the El Nabta region yielded a much poorer fauna composed of reptiles, birds including ostrich (eggshell fragments), hare (*Lepus capensis*), porcupine (*Hystrix cristata*), (red fronted) gazelle (*Gazella rufifrons*), a larger gazelle (*Gazella dama*) and few remains of a large bovid which is thought to be domestic cattle. These conjectural cattle remains are dated to ca. 8000 B. P. The material collected from the Terminal Palaeolithic sites in the Bir Kiseiba region yielded also ample evidence for gazelle and hare and also some remains ascribable to domestic cattle; here the dates for the domestic cattle may go back to even ca. 9 500 B.P. (site E79/8). The identification of the presumed domestic cattle remains is based on the size and morphology of the material and its ecological context.[3] The low frequency of cattle in this sample could point to the kind of exploitation of this protein source mainly focusing on diary products (and, perhaps, also blood drawing?). If this was so, it seems that other inadequately sampled sites or sites with poor bone preservation may yield no cattle remains and, therefore, no evidence for cattle pastoralism, they may therefore be interpreted erroneously as examples of classical hunter-gatherer subsistence patterns.

Later Neolithic (ca 6 000 B.P.) sites in the area of El Nabta yielded domestic cattle and caprovids. This fauna is also known from contemporaneous sites from Wadi Bakht in the Gilf Kebir (Gautier, 1980).

Preliminary identification of the fauna from the Neolithic site in the Dakhleh Oasis includes elephant (*Loxodonta africana*?), rhinoceros (*Ceratotherium simum*?), a large equid (*Equus* sp., zebra?), hartebeest (*Alcelaphus* cf. *buselaphus*), small gazelle (*Gazella* cf. *dorcas*), large gazelle, wild cattle (*Bos primigenius*), ostrich (*Struthio camelus*) and large avian remains. An assemblage from a site containing mixed Neolithic and Old Kingdom material yielded hartebeest, small gazelle, large gazelle, wild or domestic cattle, ostrich and some large avian remains. Scattered remains from dynastic sites contain domestic cattle, domestic pig, small livestock, ass or horse, gazelle (*Gazella dorcas*) and rodents such as *Gerbillus* sp. (Churcher, 1980).

Our review does not list post-Pharaonic faunal samples because such analyses do not exist, except for a note by Dzierżykray-Rogalski *et al.* (1972) on the bone-working at Kom el Dikka in Classical and Medieval Alexandria. To some researchers such analyses may seem to be uninteresting, but they certainly help to evaluate older finds.

[3] The reasoning is that the identified frequent game animals from these sites indicate poor grazing conditions in this area at the Terminal Palaeolithic and hence larger bovids seem to have been the domesticated animals brought to the area by human groups, and were not a part of the local wild fauna.

9. Comments and conclusion

This review should make clear that the present state of the archaeozoological research in Egypt and the Sudan is rather restricted und uneven, both in its scope and quality. It is difficult, therefore, to draw definite conclusions. However, one can, for example, safely picture the Nile Valley as a stable, conservative environment and the Western Desert as an unstable one, subjected to appreciable climatic and faunal fluctuations. They both harbored an essentially modern fauna (Ethiopian, with some Palearctic elements) during the Later Pleistocene and some presently extinct forms. Along the Nile, the disappearance of this fauna was mainly caused by human activities. In the desert, the climatic change was apparently the main cause for the disappearance of most of the game animals, although I wonder whether prehistoric overgrazing by cattle and, particularly, small livestock may not also have played a role in the process of the desertification. One can also easily imagine that the labile environment of the Western Desert favored the very early development of cattle pastoralism. As the wild cattle is indigenous to North Africa it could have been domesticated independently in this region, but questions related to the how, when and why of this process have not yet been fully answered. Small livestock seem to have been imported from southwest Asia and so was, probably, the domestic pig. From exactly where and by which route the cattle, small livestock and pig came to the Delta, the Nile Valley and the Western Desert is open to further research. One could elaborate on the foregoing, but to avoid idle speculation we need excavations on more sites in Egypt and the Sudan and more research on the faunal assemblages dated to the critical Terminal Palaeolithic and Early Neolithic periods. Only this can provide us with sound evidence and enable us to build new models of the origins and spread of animal domesticates in this part of Africa.

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