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A Pre-Dynastic Ass (*Equus asinus*) from the Sheikh Muftah Cultural Horizon of the Dakhleh Oasis, Western Desert, Egypt

This report on an early domestic donkey is dedicated to Lech Krzyzaniak and his consuming interest in the petroglyphs of Dakhleh Oasis. Lech and his wife, Karla Kroeper, recorded hundreds of depictions of animals, but few of them are equids. Donkeys with loads or harness are not uncommon, but late chronologically; there are some questionable zebras of probable older dates, but no wild asses. We hope this discovery may illuminate the history of asses in northeast Africa and their place in its wild fauna.

Abstract

Much of the skeleton of a small ass (*Equus asinus*) was recovered from alluvial pan sediments in the Dakhleh Oasis, south of Masara, on February 9th, 2002. The skeleton comprises the lower jaw, ribs from the right side of the chest, long bones from three of the four limbs, and some wrist, ankle and pedal elements. No signs of butchering or skinning, and no bone breakage prior to burial, are evident. Absence of some major elements, e.g., skull, vertebral column, one entire limb, and compact packing and flexing of the limbs, indicate selection of the portions present, and their interment as a unit without foreign debris, suggest an intentional and planned discard. The elements were placed on the existing sediment surface without signs of a pit, without any obvious arrangement, and with a naturally distinct layer sealing in the bones. This layer contained Late Sheikh Muftah cultural lithic flakes.

Elements of a second animal were recovered in association with the main skeleton and apparently form part of a skeleton represented by elements in a

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hearth midden some 10 m to the west, indicating the coeval relationship of the hearth midden and the discarded ass bones.

Also in the hearth midden were two massive bovid calcanea, one each of wild cattle (*Bos primigenius*) and Cape or African buffalo (*Syncerus caffer*), and elements of goat (*Capra hircus*). These finds indicate that the Sheikh Muftah peoples possessed cattle and asses, and were able to hunt or scavenge Cape buffalo. Goat (*Capra hircus*) has been reported previously from Sheikh Muftah cultural contexts.

Introduction

An area of Holocene pan or marsh silts along the southern margin of cultivation south of Esbet Masara (Loc. 406; Lat. 25°28′21.12″N, Long. 29°03′16.26″E), El Wassif el Dakhl (The Dakhleh Oasis), Wadi el-Gedid (New Valley), Western Desert of Egypt, contain a number of middens or hearth mounds dating to the Late Sheikh Muftah cultural period, about 5,000 to 4,000 B.P. The hearth mounds are some 10-15 m apart, contain many fragments of pottery, some lithics and fire-cracked stones, and bones, some broken. Some areas have dense invasions by gypsum crystals (magnesium sulphate), especially on the surfaces of old roots, pottery sherds, or along cracks in the clayey silts. The ancient and much deflated bottom deposits of a pan or marsh representing the last throes of a shrinking Holocene Palaeolake Kellis (Churcher & Kleindienst in press) are consistently silty and uniform, and appear to have built up from alluviation under a seasonal hydraulic lacustrine or paludrine regime of wet and dry, but without evidence of mud cracks and thus strong desiccation in dry seasons.

The unique occurrence and recovery of a partial skeleton of a wild ass or domestic donkey (*Equus [Asinus] asinus*) (ICZN 2004) in which the bones were unbutchered, some still articulated and flexed, with ribs in series, and compactly deposited has implications for the time of domestication of the wild ass. No signs of carnivore attention to the bones are evident. The bones lacked flesh when deposited, though the flexed and articulated limb elements were probably still connected by tendons. Cuts and gnaw marks are absent, and the deposition appears purposeful and tidy, and thus probably through human agency.

The skeletal elements lay within blocky gray silts associated with leaf impressions and plant remains from reeds or grasses, broad leaves, and small twigs. The bones rested on a 2-3 cm thick friable, granular, charcoal rich layer, in which small pieces of burnt bone occur. This layer was soft enough to be excavated with fingers. Late Sheikh Muftah cultural evidence is present in the friable basal layer as well as in the upper layer sealing in the bones. The ass is therefore considered coeval with the Late Sheikh Muftah peoples' nearby occupation layers.

The bones at the skeleton site were in two groups – a small southern cluster with a metatarsal, a thoracic vertebra, and some ribs (02-H-30 *s* right metatarsal III, vertebra and ribs uncatalogued) and a larger northern cluster with tibia, cubitus, astragalus, mandible, a thoracic vertebra, scapula, and humerus (02-H-30 n rt. tibia, *e* rt. cubitus, *q* rt. astragalus, *a+b+c* mandible, rt. scapula *d*, and rt. humerus *t*). These are listed in Table 1, Materials, and measurements of the lower dentition and main skeletal elements given in Tables 2 and 3, respectively. Some smaller elements (phalanx, calcaneum, podials, etc.) had been freed by aeolian erosion and distributed downwind of the cluster. Some had suffered hollowing of surfaces from wind erosion. An interesting aspect of the collection is the absence of the skull or any part of it, the presence of but a single scapula and humerus, and only three thoracic vertebrae when 12 ribs are present. An articulated right forelimb (represented by flexed humerus, cubitus and metacarpal III) was wedged into the lingual fossa of the mandible at right angles to the molar rows with the jaw lying on one of its labial faces: a metatarsal III lay parallel to the occlusal dental faces. It appeared that the bones had been set down as compact bundles and left on the surface of the charcoal-rich lower layer, to become buried in what may have been a fairly massive silt unit (20-25 cm thick). As no gnawing, disarrangement or dispersal from carnivore or scavenger activity is evident, and as the bones remained in tidy groupings, it may be that the pan site was flooded at the time or soon after the bones were set down and thus they were never available to scavengers. A right radius (30f.) and a right scaphoid (30 x) may belong to a second animal (see next).

Additional skeletal elements of ass were recovered from a hearth midden some 10 m west of the bone cluster (specimens H-68 a-f). Only one of these appears to belong to the same individual as those in the main cluster, and the rest are considered to belong to a second and more robust animal than the bones that represent the first animal; possibly these represent male and female individuals, respectively. Within this hearth midden and thus temporally and spatially associated with the two asses, elements of cattle (*Bos* cf. *taurus* or *B. primigenius*), African or Cape buffalo (*Syncerus caffer*), Dorcas gazelle (*Gazella dorcas*), and goat (*Capra hircus*) were recognised.

Description of Material

Bones and fragments of cattle are the most obvious in Sheikh Muftah hearth middens because of their larger size and resistance to destruction. Gazelle and goat bones may be more numerous in the original composition of the bony debris but are liable to be removed first from the midden by hyaenas and canid scavengers. In the hearth-mound cow is well represented by many elements, including teeth, e.g.g., lower third molar or milk fourth premolar, distal ends of fused metacarpals III+IV, podials (two navicular-cuboids, astragalus, calcaneum,

pisiform, ulnare, two magna, phalanges I, II, and three unguals III, and proximal volar sesamoid III). Cape buffalo is represented by a calcaneum, two maleolars and the proximal end of phalanx I. Dorcas gazelle is sparsely represented but confirmed by a male horncore tip. Goat is well represented by many parts, including teeth, longbone shafts, and part of a massively ridged adult male horncore. Differentiation of the buffalo postcranial elements from those of cattle relies on distinctions between *Bos* and *Syncerus* advanced by Peters (1988). Measurements of the *Bos* calcaneum is large for domestic cattle from the Dakhleh Oasis Old Kingdom deposits at Ein el-Gezareen and may represent *B. primigenius*, but they are still smaller than those typical for *Syncerus*; the calcanea differ qualitatively as for *Bos* and *Syncerus*, respectively.

Discussion

The source of the domesticated ass or donkey is obscure, with postulated origins as disparate as North America (Texas) (Quinn 1958) or Northeast or East Africa (Egyptian and Sudanese Red Sea Hills, or Ethiopian Highlands) (Haltenorth & Diller 1980). Most Egyptian evidence is subfossil and derives from early historic or pre-dynastic levels of Old Kingdom Pharaonic Egypt, and is thus donkey. A single metatarsal III is recorded from Bed II, 1.5 Myr BP, in Olduvai Gorge, Tanzania (Churcher 1982) which, upon comparison, appears indistinguishable from the modern animal. While not conclusive, this evidence from ca. 1.5 Myr BP suggests an eastern African origin, probably in the drier areas of the broken terrain along the Great Rift Valley as Pleistocene evidence of *Asinus* in Asia is sparse. Quinn (1957; 1958) applies *Asinus* to Nearctic equines that are usually placed in *Equus*. *Equus Asinus africanus* was endemic in the Atlas as late as 300 AD, but there seems to be 'no definite evidence of a continuous range within historic times across the northern part of the continent to the Sudan' (Ansell 1971: 5-6).

Bones and teeth of asses are found scattered over Dakhleh Oasis, its nearby desert and the Libyan Escarpment. This is probably due to the habit of the local dogs, foxes and jackals of transporting isolated elements from the dead donkeys dragged into the desert to dehydrate and disintegrate (termed 'caniports' – lower jaws, isolated bones or lower limbs or feet with wrists or ankles and possibly cannon bones). They may be found as much as 10 km from the nearest habitation, and hence occur on many Neolithic sites within their surficial lag deposits. Such bones are assigned recent historic ages and are not considered to influence the early local history of this animal. Ass/donkey is identified from Archaeological Localities 072, 092, 108, 118, and 136, and ass teeth were recovered from a fire pit, Locality 135, south of Kellis' South Tombs. Donkey is also known from the Old Kingdom site of Ein el-Gezareen and the Romano-Byzantine sites of Kellis (Ismant el-Gharab) and Mouthis (Ismant el-Mut).

Haltenorth and Diller (1980: 109) summarize the history of asses in the Saharan region and consider them as originally extant 'from Morocco to Cyrenaica, extinct [in the wild] by about AD 300' and 'formerly [in] the savannah zone, or in prehistoric times also in the Sahara including the geographic E. Sudan from Kordofan ... to N.E. Egypt.' Hoogstraal (1964) considers *E. asinus taeniopus* as the local subspecies.

Haltenorth and Diller (1980: 109) state 'In Ancient Egypt [the ass was] domesticated about 4000 BC, as the source of domestic donkeys'. Instances of ass bones or teeth occurring in surficial layers (see above) have raised the possibility that an ass may have been known to the later Neolithic inhabitants. Gautier (1980) noted ass remains from the Middle Palaeolithic sites of Bir Tarfawi and Bir Sahara. Butzer and Hansen (1968) list ass from Late Palaeolithic sites in shoreline deposits of a palaeolake stage in the Fayum Depression. Churcher (1972), Gaillard (1934), Oakley (1965) and Reed and Turnbull (1969) record ass from Late Pleistocene and Epipalaeolithic sites in the Plain of Kom Ombo. Van Neer and Uerpmann (1989) suggest that wild *E. asinus* once occupied areas in the northwest Sudan. A relict population may exist 'in the Libyan-Egyptian border region near Giarabub north of Siwa Oasis (... and [represents] perhaps survivors of *[Asinus] atlanticus* ?)' (Haltenorth & Diller 1980: 109).

A partial skeleton was excavated from pan deposits stratigraphically below an extensive Sheikh Muftah cultural site (Loc. 136) in Camelthorn Basin but was dismissed as an intrusive burial (Churcher 1986b). However, partial hartebeest skeletons in apparently articulated or approximate skeletal relations recovered from similar pan deposits in both the Sheikh Muftah pan area (Loc. 072) and along the eastern edge of Camelthorn Basin (Loc. 358) suggest that the Loc. 136 ass could have been a natural burial independent of human aid.

The status of the Locality 406 ass, based on recovered evidence, is that of a domesticate in late Sheikh Muftah cultural times, within a time span of 3,000 to 2,000 BC or 5,000 to 4,000 BP, with the possibility of individuals existing as a wild population in earlier Bashendi cultural times. This conclusion supports the opinions of Butzer and Hansen (1968), Churcher (1972), Haltenorth and Diller (1980) and Reed and Turnbull (1969).

The status of asses in the Late Neolithic of Dakhleh Oasis is still somewhat unclear as it appears to have been a domesticate of the local pastoral peoples and may have been also a member of the extant wild fauna. The wild subspecies of the Western Desert may have been *E. a. africanus* extending north from the Sudan (Ansell 1971). Hoogstraal (1964) prefers *E. a. taeniopus*, which Ansell considers synonymous with *E. a. somaliensis*. Haltenorth and Diller (1980) prefer *E. a. atlanticus* of the Atlas (Morocco to Tunisia) extending east to Cyrenaica and Egypt. It is impossible to determine subspecies from fossil

evidence, especially for terrestrial mammals whose taxonomy often depends on pelage colouration.

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Table 1. Materials.

The following specimens are identified within one catalogue number as 02-H-30, items a to z, aa to bb. 30 y is unused.

a	L dentary, horizontal ramus only; compressed laterally and ascending ramus damaged.
b	R dentary, horizontal ramus only; as for 'a'
c	symphysial region with incisors, shattered and compressed
d	R scapula, damaged in vertebral area
e	R cubitus (radio-ulna), entire
f	R radius, larger, lacking distal end, eroded. 'e' and 'f' represent two different individuals. 'f' probably part of 20-H-68.
g	R metacarpal III, entire
h	L metacarpal III, entire
i	R phalanx I
j	L phalanx I, lacking distal end
k	R phalanx II. Articulates with 'i' and 'l'
l	R phalanx III (ungual), wind eroded
m	R tibia, damaged
n	L tibia, lacking proximal end. 'm' and 'n' from same individual
o	R patella
p	L calcaneum, restored
q	R astragalus. Matches 'z'
r	4 proximal sesamoids
s	R metatarsal III, entire
t	R humerus, shaft only
u	R splint metatarsals II and IV. Articulate with 's'
v	L humerus, shaft and distal end
w	incisor fragments, isolated
x	R scaphoid. Different and larger individual than 'aa', below; probably part of 02-H-68.
z	L astragalus, entire
aa	L scaphoid, entire
bb	L unciform, entire

Additional ass skeletal elements recovered from the hearth midden deposit. Catalogued as 02-H-68, items a to f.

a	R metacarpal III, entire
b	L tibia, proximal end. Not part of 02-H-30, and does not mirror 30 n
c	metacarpal III. Now missing
d	L cuboid tarsal, lateral half, small individual

e	R patella, fragment
f	R splint metacarpal IV. Articulates with 02-H-68a

Assignment of elements to individuals.

The following groups of elements appear to articulate with one another and to represent discrete individuals.

Animal 1.

This animal is mainly represented by the elements found in the main cluster of ass bones (02-H-30 a-z, aa-bb). The right forelimb elements were found flexed across the lingual cavity of the mandible. Right forelimb elements – scapula 30 d, humerus 30 t, cubitus 30 e, scaphoid 30 x, metacarpal III 30 g. Left forelimb elements – humerus 30 v, unciform 30 bb, and metacarpal III 30 h. Right hindlimb elements – tibia 30 m, patella 30 o, astragalus 30 q, metatarsal III 30 s, splint metatarsals II and IV 30 u. Left hindlimb elements – tibia 30 n, astragalus 30 z, calcaneum 30 p. A mandible in three pieces 30 a, b, and c is assumed to belong to the same individual.

Animal 2.

Two elements (30 f and 30 x) were found mixed with the elements constituting Animal 1 but represent the second more robust individual (02-H-68 a-f). Four other robust elements were recovered from the nearby hearth mound. Right forelimb elements catalogued within 02-H-30 – radius 30 f, R scaphoid 30 x; various elements catalogued within 02-H-68 – L tibia 68 b and L cuboid 68 d, and R metacarpal III 68 a, R metacarpal IV 68 f (articulates with Mc III 68 a), and R patella 68 e.

Table 2. Measurements of lower dentition of *Equus asinus* from Loc. 406, Masara, Dakhleh Oasis, Egypt.

Abbreviations: L = left; R = right; cem = cement; enam = enamel. Dimensions: proto-metacond = protoconid-metaconid width; hypo-m'conulid =hypoconid-metaconulid lenght; hypo-entoconid = hypoconid-entoconid width; meta-m'conulid = metaconid-metaconulid. Measurements over enamel ridges only are less than those over cementum and enamel. All teeth are in mandible 02-H-30 a and b. Measurements in mm.

Tooth		Mesiodistal Length	Buccolingual width over proto-metaconid	Buccolingual width over hypo-m'conulid	Buccolingual width over hypo-entonconid	Mesiodistal lenght over meta-m'conulid
		enam cem	enam cem	cem enam	enam cem	enam
P_2	L	28.9 28.6	11.4 12.8	14.3 16.0	12.2 15.2	14.5
	R	27.9 28.1	12.6 12.7	14.4 15.8	12.6 16.0	13.8
P_3	L	25.0 25.5	15.0 17.0	15.8 18.1	11.7 17.6	17.0
	R	24.8 24.8	14.5 17.2	16.7 18.8	13.4 18.9	16.5
P_4	L	24.4 25.3	15.2 18.4	15.8 18.3	12.1 17.2	15.5
	R	24.9 25.1	15.5 16.4	16.4 18.6	12.1 16.4	16.2
M_1	L	22.3 22,2	13.5 16.8	13.0 16.2	10.9 15.6	13.3
	R	22.5 22.5	13.0 17.5	14.0 16.3	12.3 15.2	13.2
M_2	L	21.6 20.8	12.8 15.2	12.1 14.6	14.2 13.4	13.3
	R	21.4 20.0	13.2 15.7	12.4 14.1	15.6 14.2	13.0
M_3	L	23.8 25.3	12.1 13.6	11.6 12.2	9.0 10.7	11.3
	R	24.1 26.6	11.4 14.0	9.6 12.6	8.7 11.6	11.0

Total length of toothrow P_2-M_3 = L 147, R. 146;

Length of premolar row = L 78.2, R 67.6;

Length of molar row M_1-M_3 = L 68.1, R 67.6.

Table 3. Measurements of whole postcranial elements of Equus asinus from Loc. 406, Masara, Dakhleh Oasis, Egypt.

Abbreviations: TL = total or overall length; AP = anteroposterior diameter; Tvs = transverse diameter; Prox = proximal; MidS = midshaft; Dist = distal and Cond = condylar positions; Mc = metacarpal; Mt = metatarsal; Ph = phalanx; radio-ulna = cubitus or radio-ulna;

Numbers refer to elements catalogued within specimen number 02-H-30.'-' indicates dimension does not exist. Measurements in mm.

Dimension	Mc III	Mc III	Mc III	Mc III	Ph I	Ph II	Radio - ulna		tibia	astragali	
	30g	30h	68a	30s	30i	30k	30e	30f	30m	30q	30z
TL	190	188e	172	233	70.1	33.4	279	330e	288	47.6	45.0
Prox AP	26.9	26.0	22.0	36.0	28.0	21.1	27.1	29.8[3]	58.8	27.2[4]	25.0
Prox Tvs	39.3	37.8	36.1	38.3	37.2	34.2	59.9	-	66.9	37.0	39.7
MidS AP	17.3	17.5	17.0	19.9	17.4	14.5	19.4	-	28.4		
MidS Tvs	22.2	21.5	22.5	20.8	21.0	29.3	17.0	-	21.4		
Dist AP	15.1	16.1	14.0	34.5	13.6	-	31.7	-	-		
Dist Tvs	35.7	35.3	30.9	17.5	31.3	-	54.5	-	-		
Cond AP	26.0	24.5	21.3e	27.1	17.9	18.1	23.5	-	34.4	45.2	44.4
Cond Tvs	35.2	34.8	30.9	35.0	31.5	30.8	46.4	-	64.0	32.0[5]	31.7[6]

[3] Depth in semilunar notch

[4] Over navicular-cuboid facet

[5] Tibial facet

[6] Tibial facet