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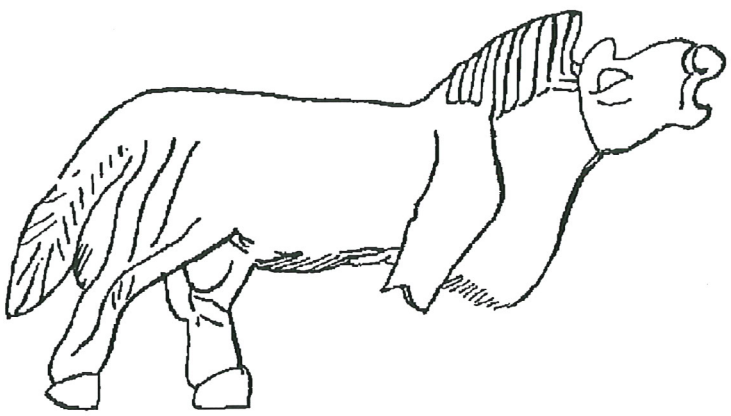

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VOLUME B

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VOLUME A

AN HYKSOS HORSE FROM TELL HEBOUA (SINAÏ, EGYPT)

Louis Chaix[1]

Abstract

Northern Sinaï is a strategic and commercial area between Asia and Africa, since the prehistory. The site of Tell Heboua is situated in the eastern part of the Nile delta. A large fortified town, built in mud bricks shows an occupation from the Second Intermediate Period (1786-1552 BC) to the beginning of the New Kingdom. In the levels from the Second Intermediate Period, the skeleton of an adult horse was discovered. The study of this animal bring new informations about the diffusion of this species from Asia to Africa. The morphology and the stature of this horse are presented and compared with the rare finds of the Nile valley.

Résumé

Le nord du Sinaï est une zone stratégique et commerciale qui relie, depuis la préhistoire, l'Afrique à l'Asie. Le site de Tell Heboua se trouve dans la région orientale du delta du Nil. Une importante ville fortifiée, bâtie en briques crues, témoigne d'occupations allant de la Seconde Période Intermédiaire (1786-1552 BC) jusqu'au début du Nouvel-Empire. Dans les niveaux de la Seconde Période Intermédiaire, le squelette d'un cheval adulte a été mis au jour. L'étude de cet animal apporte des informations nouvelles sur la diffusion de l'espèce en Afrique. La morphologie et la taille de ce cheval sont présentées et comparées aux rares trouvailles faites dans la vallée du Nil.

Key Words: Egypt, Sinaï, Horse, *Equus caballus*, New Kingdom, Morphology, Osteometry

Mots Clés: Égypt, Sinaï, Cheval, *Equus caballus*, Nouvel Empire, Morphologie, Ostéométrie

Introduction

Northern Sinaï has been a strategic and commercial area between Asia and Africa since prehistoric times (Caneva 1992; Valbelle and Abdel Maksoud 1996). In 1979, the Archaeological Mission of the Egyptian Antiquities Organisation (Dr. Mohamed Abdel Maksoud) in collaboration with the Institute of Egyptology from the University of Lille III , France (Prof. D. Valbelle), began to study the archaeological sites of the northern part of the Sinaï (Valbelle *et al.* 1992). In addition to Katya, Peluse, El Kantara, and Tell el Herr, the site of Tell Heboua is of interest, with levels dating from the Second Intermediate Period to the beginning of the New Kingdom, around 1786 to 1552 BC.

This large town had numerous buildings made from mud-bricks (Abdel Maksoud 1992). In the western part of the city, a large construction with important walls, probably a palace, was discovered. The skeleton of a horse was found in the eastern part of this building. Its stratigraphic position indicates a date between the end of the Second Intermediate Period and the very beginning of the New Kingdom. No date is available on the horse itself.

After its discovery and excavation, the whole skeleton was consolidated using an acrylic resine and preserved in a house in El Kantara. This treatment has the disadvantage that it does not permit detailed anatomic observations, particularly for the teeth. It also makes some measurements impossible because it is impossible to remove the bones from their original positions.

The horse was lying on its right side, the head facing west. Fore limbs are folded behind, at the level of the carpal bones, while the posterior legs are in a straight position (Fig. 1). Many bones are missing, particularly the rachis and the pelvis, probably destroyed by the building of the northern wall.

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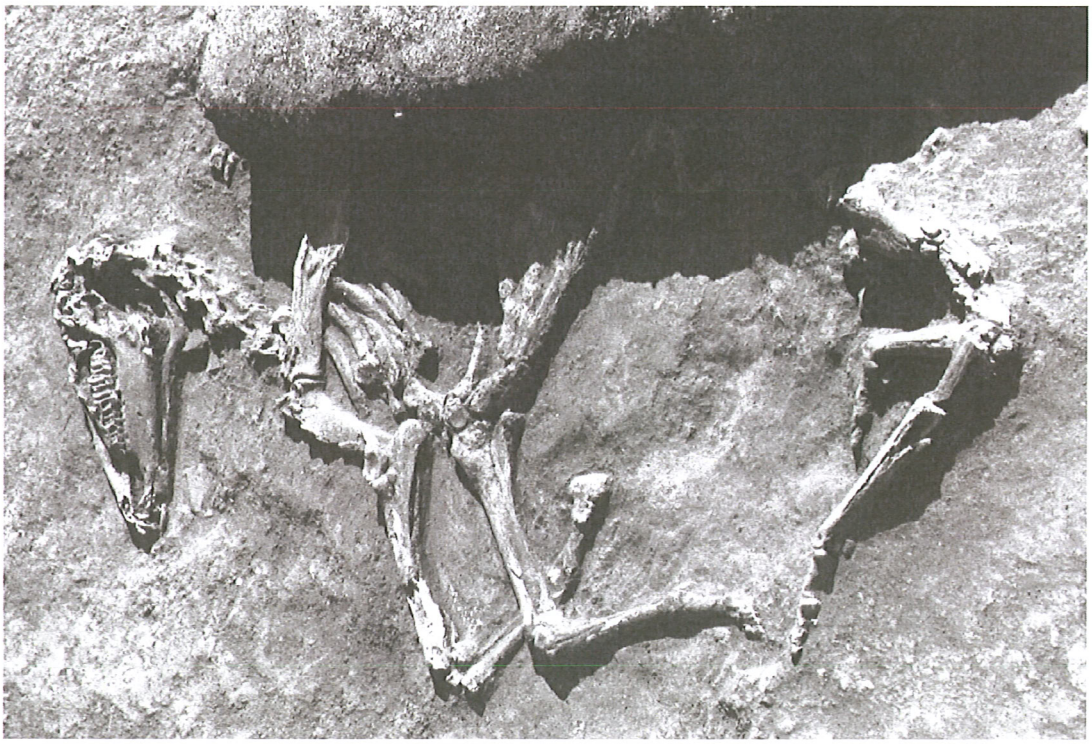

Fig. 1. The horse from Tell Heboua

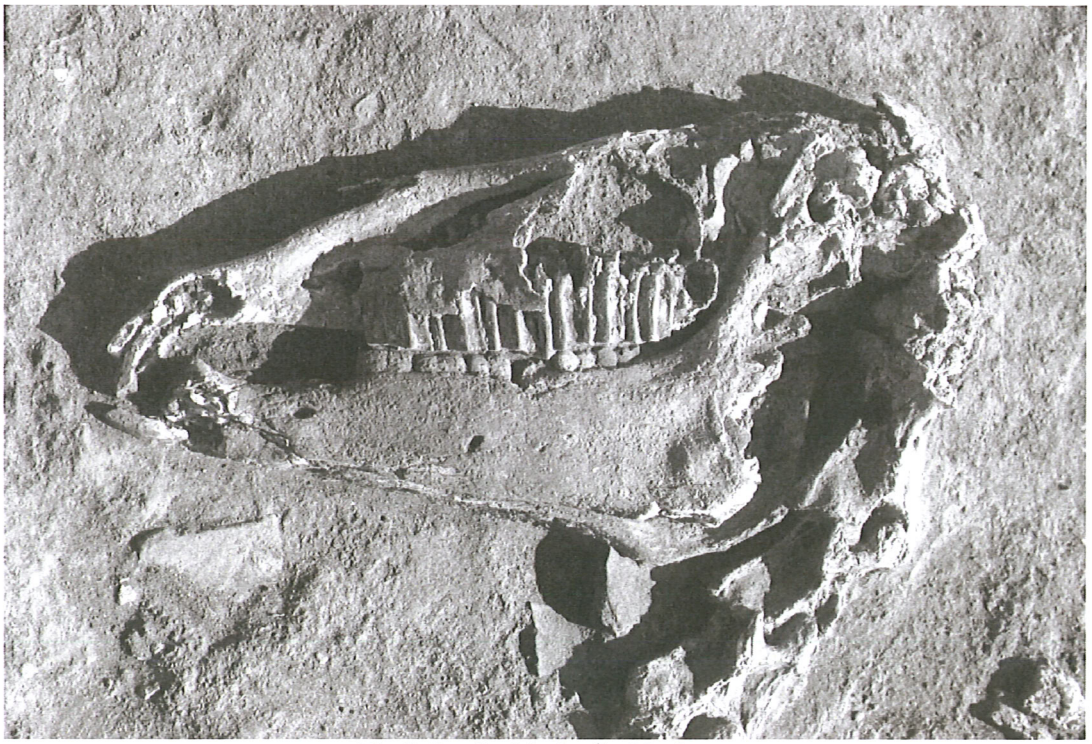

Fig. 2. Detail of the head of the horse

Some other bones are in a very bad state of preservation. The skull was eroded and large portions of the left maxillary and frontal are missing. The upper left cheek-tooth row was bare (Fig. 2).The posterior part of the left mandible shows a degradation of the goniac portion. The maxillary and mandible are occluded, which prevents the examination of the biting surfaces.

The anterior limbs are complete but badly damaged. The blades of the two scapulae are almost fully destroyed and like the humeri, are strongly fragmented and not measurable. The forearms and feet are better preserved. Only six cervical vertebrae are present from the vertebrate column. The lumbar and thoracic vertebrae are absent or just represented by some very small fragments. This bad preservation does not allow precise examination of the lumbar section, useful for the discrimination between Arab breeds and others (Stecher 1962). Some pieces of the left anterior ribs are present. The pelvis is severely damaged. The left posterior limb is better preserved, with some pieces of the femur, the tibia, and a complete left foot. The right limb is partly destroyed.

Age and sex

The morphology of the occlusal part of the incisors indicates an age younger than eight years (Habermehl 1975). Observations on various parts of the skeleton show that all the long bones are fused. The same is noted for the cervical vertebrae, with their discs completely attached. These features indicate an age older than five years. In conclusion, we can attribute an age between five and eight years to this animal. The complete absence of upper and lower canines seems to indicate a female. However, the badly damaged pelvis does not permit the sex to be confirmed.

Osteometry

Despite the bad state of the skeleton, some measurements were taken (von den Driesch 1976). They are presented in Appendix 1. The withers height was estimated after Kiesewalter (1888) and Vitt (1952) with the following results:
Radius: 1.50 m; metacarpal: 1.45 m; metatarsal: 1.46 m, with the mean being 1.47 m at the withers.

Using Vitt's tables, the horse from Tell Heboua can be placed in the medium size group, between 1.36 and 1.44 m.

Complete skeletons of horses are rare in this area. Nevertheless, we can compare the horse of Tell Heboua with some other finds, mainly from the Nile Valley (Leclant 1975). The map shows the location of the discoveries (Fig. 3). From north to south, we have first the remains of horse teeth from Tell ed-Daba dated to 1600 BC (Boessneck 1976). The second find comes from Saqqarah. Three horses were found. One of these animals was deposited in a wooden coffin, buried in a cloth. It was dated approximately to between 1300-1200 BC. The skeleton was reconstructed and shown in the Cairo Museum. This animal was 18 years old, with a withers height of about 1.45 m (Quibell and Olver 1926). Another horse was discovered at Deir el Bahari, in front of the grave of Senenmout. The mounted skeleton was studied by Chard (1937) and Boessneck (1970). This animal, of uncertain sex, is slightly built with a withers height of 1.43 m. The Buhen horse was found in a fortress, near the second Nile cataract, in the northern Sudan. The horse was killed during the first sacking of the building, in 1675 BC, and discovered lying on a brick pavement. This animal is a male of about 19 years old. This horse is very similar to the Arab breed, with a withers height of around 1.51 m (Clutton-Brock 1974). The island of Saï, between the second and the third cataract, has contributed numerous archaeological remains. A horse was found in the center of a tumulus dated from Late Kerma to the beginning of the New Kingdom (Gratien 1986). This animal, as yet unpublished, has a withers height of around 1.42 m (Chaix, in press). At around 20 kilometers south of Saï, the large cemetery of Soleb contained a grave from the reign of Amenophis III (around 1408-1372 BC). The whole skeleton of a horse was found in a pit. It is a male of ten years, with a withers height of around 1.36 m (Ducos 1971). At Kurru, 24 horse graves were found in a royal cemetery dated from the Meroitic period (700-690 BC), right below the fourth cataract. Two skeletons were brought to Boston.

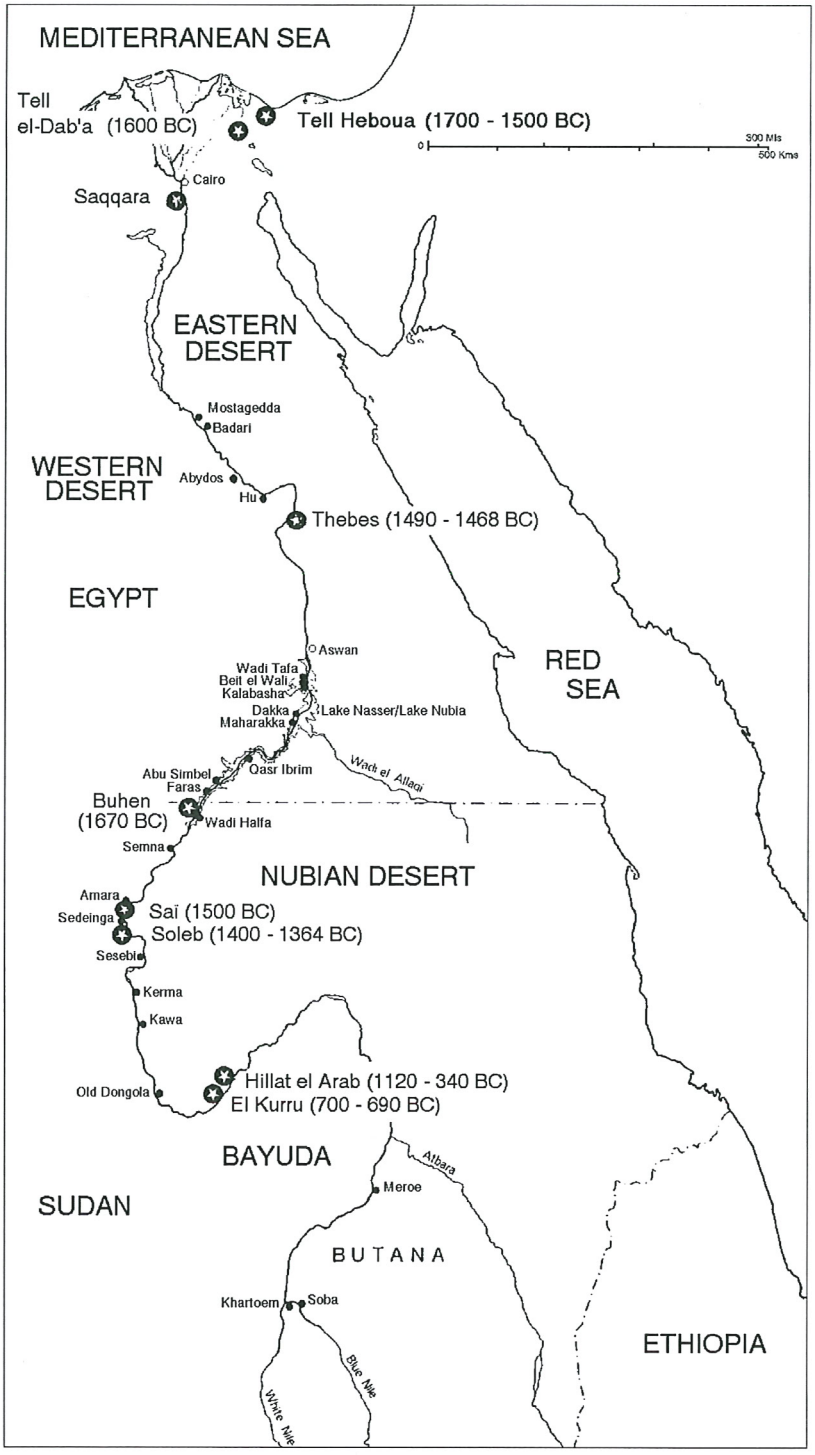

Fig. 3. Map of the horse finds (Egypt and Sudan)

Table 1. Length of the inferior cheektooth-row (alveoli)

Tell Heboua	180.0
Soleb	163.8
Buhen	173.0
Thebes	165.0
Dongola	166.0
European Neolithic	168.0
European Bronze Age	165.0-187.0
Iron Age	161.0-179.0
Manching	143.0-172.5
Roman	148.0-186.0

Table 2. Metapodials: slenderness index

METACARPAL	Proximal breadth/Length	Smallest breadth of the diaphysis/Length	Distal breadth/Length
Tell Heboua	21.7	-	-
El Kurru	22.4	14.2	20.8
Buhen	23.1	13.9	21.3
Thèbes	22.6	13.9	21.7
Soleb	22.6	16.1	20.9
Saï	22.9	13.0	20.9
Dongola	20.8	12.4	20.4
METATARSAL			
Tell Heboua	-	13.2	16.7
El Kurru 1	18.2	11.0	17.5
El Kurru 2	18.1	10.5	17.1
Saï	18.7	10.8	18.2
Dongola	18.5	9.8	17.7
Dongola	17.4	9.8	16.9

These two seem to be adults, and very probably males. The withers height is around 1.52 m for one and 1.55 m for the other (Bökönyi 1993).

Finally, the remains of horses were found at another site, Hillat el Arab, four kilometers south of th fourth cataract. This necropolis dates from the Napatan period, between 1120 and 340 BC. These horse bones are still being studied (Chaix, in press).

The means of conservation and the bad state of preservation of the horse from Tell Heboua do not allow many measurements.They are summarised in Appendix 1. We have observe that for the skull the length of the cheektooth row is bigger than for the horses from Buhen and Soleb.

Table 1 shows the same thing for the length of the inferior cheektooth row, compared with horses from various archaeological contexts (Boessneck *et al.* 1971) and also with two modern horses from Dongola (Bennett *et al.* 1948).[nos 21012/2 and 2102/9 of the Archaeozoological Department in Geneva].

The study of the slenderness indexes for the metapodials and the first phalanxes, is also interesting.

For the metacarpal, we have used the proximal breadth versus the greatest length. The results are presented in Table 2 and on Figure 4. The horse from Tell Heboua is characterised by a robust metacarpal, like those from Buhen and Kurru and close to those of the first domestic horses from the Neolithic of the Ukraine (Nobis 1971). The same observation was made on the first anterior phalanx, using the smallest breadth of the shaft versus its greatest length (Fig. 5). The dimensions of the hind foot, especially of the metatarsal and the first phalanx, display the same phenomenon. In terms of the metatarsal, the individual from Tell Heboua falls in the upper part of the range of variation while the other horses from the Nile valley exhibit slender metatarsals (Fig. 6). The first posterior phalanx is also clearly stronger, like that from Buhen, compared with the horses from the Iron Age of Europe (Fig. 7).

In conclusion, about the morphology of the horse of Tell Heboua, we can speak of a medium size animal, smaller than the horses from El Kurru. It was characterised by a heavy head with large teeth and robust distal limbs (metapodials and first phalanxes). It seems to belong rather to the " breviligne" type than to the slender animals from the "longiligne" type (Rommelaere 1995).

According to the dating of the rare horses studied from the Northern Sinaï to the Nubian part of the Nile Valley, presented in Table 3, it seems that this species was introduced rapidly but in a discrete manner until the area of the fourth cataract.

The horse from Tell Heboua seems to be the most ancient, preceding the Egyptian horses, mostly dated to the reign of Thoutmosis I and later (Braunstein-Sylvestre 1984).

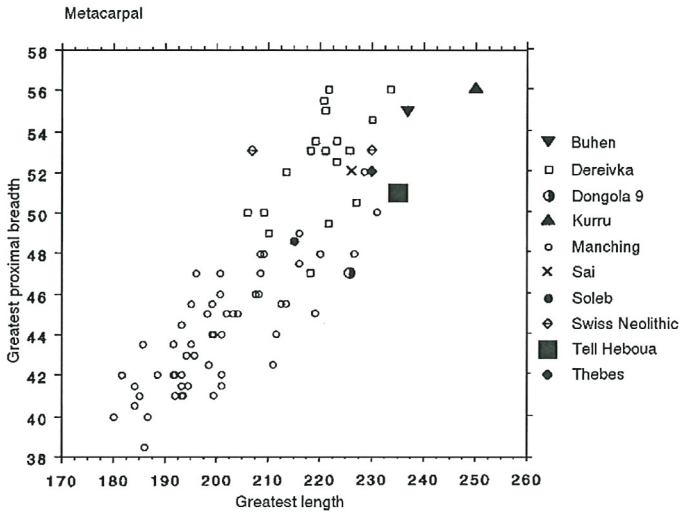

Fig. 4. Metacarpal: scattergram of the slenderness
(Greatest Length versus Greatest Proximal Breadth, mm).

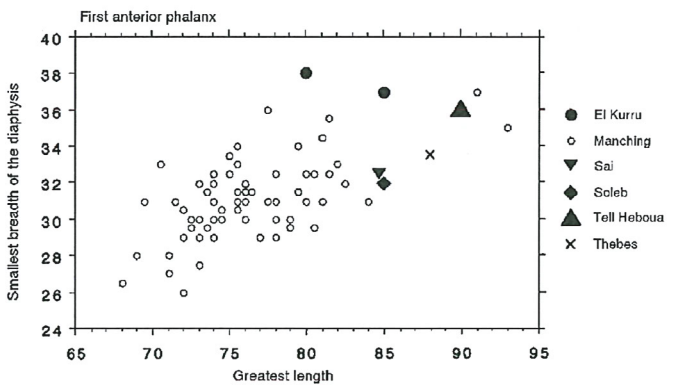

Fig. 5. First anterior phalanx: scattergram of the slenderness
(Greatest Length versus Smallest Breadth of the Diaphysis, mm).

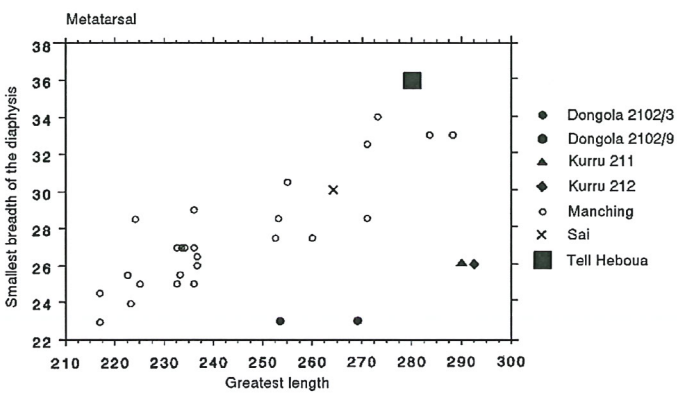

Fig. 6. Metatarsal: scattergram of the slenderness
(Greatest Length versus Smallest Breadth of the Diaphysis, mm).

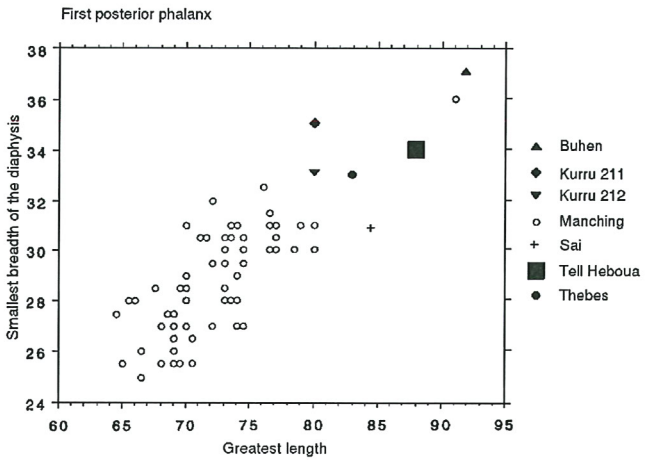

Fig. 7. First posterior phalanx: scattergram of the slenderness (Greatest Length versus Smallest Breadth of the Diaphysis, mm).

Table 3. Dates of the Egyptian and Sudanese horses

SITE	DATE	AUTHOR
Tell Heboua	~1786 - 1552 BC	Chaix, this paper
Tell El Dab'a	~1630 - 1600 BC	Boessneck, 1976
Saqqarah	~1300 - 1200 BC ?	Quibell and Olver, 1926
Thebes	~1490 - 1468 BC	Boessneck, 1970
Buhen	1675 BC	Clutton-Brock, 1974
Saï	~1500 BC	Chaix, in press
Soleb	~1402 - 1364 BC	Ducos, 1971
El Kurru	~700 - 690 BC	Bökönyi, 1993
Hillat El Arab	~1120 - 340 BC	Chaix, in press

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Appendix 1. Osteometry of the horse from Tell Heboua

SKULL	Tell Heboua	Soleb	Buhen	Thebes			
Total length (acrocranion-prosthion)	~560.0						
Length of the diastema	~125.0						
Length of the cheektooth-row (alv.)	190.0	168.0	170.0				
Length of the cheektooth-row (occl.)	186.0			168.0			
Length of the molar row (alv.)	88.0	77.2	80.0				
Length of the molar row (occl.)	84.5			79.0			
Length of the premolar row (alv.)	102.0	93.0	94.0				
Length of the premolar row (occl.)	104.0			92.0			
Length of P2	41.5	37.2	40.4				
Length of P3	31.5	27.0	26.8				
Length of P4	31.8	26.4	27.4				
Length of M1	27.0	22.4	22.8				
Length of M2	26.2	22.6	23.9				
Length of M3	30.0	27.6	34.6				

MANDIBLE	Tell Heboua	Thebes	Buhen	Soleb	Dongola		
Length gonion caudale-infradentale	348.0	410.0	418.0		359.0		
Length condyle-infradentale	430.0				385.0		
Length gonion caudale-M3 post.	106.0				115.0		
Length gonion caudale-prosthion	288.0						
Length gonion caudale-P2 ant.	255.0				272.0		
Length of the cheektooth-row (alv.)	180.0		173.0	163.8	166.0		
Length of the cheektooth-row (occl.)	170.0	165.0			161.5		
Length of the molar row (alv.)	74.0		84.0	76.8	83.0		
Length of the premolar row (alv.)	92.0		89.0	85.8	83.0		
Length of the premolar row (occl.)	92.0	85.0			82.0		
Length of P2	31.0		37.0	32.2	31.0		
Length of P3	32.0		27.2	26.8	26.0		
Height behind M3	93.0			101.5	90.0		
Height before P2	52.0			53.0	50.5		

SCAPULA	Tell Heboua	Kurru					
Height along the spine	355	392					

RADIUS	Tell Heboua	Kurru	Saï	Thebes	Dongola 3	Dongola 9	
Greatest length	347.0	366.0	338.0	348.0	347.5	326.5	

METACARPAL	Tell Heboua	Kurru	Buhen	Thebes	Soleb	Saï	Dongola 9
Greatest length	235.0	250.0	237.0	230.0	215.0	226.3	225.5
Lateral length	227.0					221.0	217.0
Greatest proximal breadth	51.0	56.0	54.8	52.0	48.6	52.0	47.0
Smallest depth of the diaphysis	29.0	24.0				23.0	21.5

Appendix 1. continued

PHALANX I anterior	Tell Heboua	Kurru 211	Kurru 212	Thebes	Soleb	Saï	
Greatest length	90.0	80.0	85.0	88.0	85.0	84.7	
Greatest proximal breadth	57.5	61.0	59.5	55.0	52.8	52.2	
Smallest breadth of the diaphysis	36.0	38.0	37.0	33.5	32.0	32.4	
Greatest distal breadth	48.0	48.0	48.0	46.0	41.2	44.3	
PHALANX II anterior	**Tell Heboua**	**Kurru 211**	**Kurru 212**	**Saï**			
Greatest length	47.0	45.5	46.0	44.2			
Greatest proximal breadth	53.5	58.0	58.5	50.0			
Greatest breadth of the Facies articularis	47.0			45.5			
Smallest breadth of the diaphysis	32.5	50.0	50.0	44.0			
Greatest distal breadth	45.0	55.0	55.0	49.0			
TIBIA	**Tell Heboua**	**Kurru 211**	**Kurru 212**	**Saï**	**Dongola 3**	**Dongola 9**	
Greatest proximal breadth	90.0	105.0	103.0	92.0	91.0	85.0	
METATARSAL	**Tell Heboua**	**Kurru 211**	**Kurru 212**	**Saï**	**Thebes**	**Dongola 3**	**Dongola 9**
Greatest length	280.0	290.0	292.5	264.5	270.0	269.0	253.5
Greatest external length	275.0			260.3	264.0	260.0	248.5
Smallest breadth of the diaphysis	37.0	31.0	31.0	28.8	29.0	26.5	25.0
Smallest depth of the diaphysis	36.0	26.0	26.0	30.0		23.0	23.0
Greatest distal breadth	47.0	51.0	50.0	48.3	49.0	45.5	45.0
Greatest distal depth	44.5	39.0	40.	38.5		37.5	35.0
PHALANX I posterior	**Tell Heboua**	**Buhen**	**Thebes**	**Saï**	**Kurru 211**	**Kurru 212**	
Greatest length	88	91.9	83	84.5	80	86	
Greatest proximal breadth	55.5	59.1	56	54.5	58.5	58	
Greatest breadth of the Facies articularis prox.	51.3			51.8			
Smallest breadth of the diaphysis	34	37	33	30.8	35	33	
Greatest distal breadth	46	49.4	43	43.9	43.5	43.5	
Greatest breadth of the Facies articularis dist.	43.1			41			
PHALANX II posterior	**Tell Heboua**	**Kurru 211**	**Kurru 212**	**Saï**			
Greatest proximal breadth	52	56	56	47.8			