

ISTVÁN VÖRÖS

SACRIFICIAL CATTLE REMAINS FROM THE EARLY  
BRONZE AGE SETTLEMENT AT SOROKSÁR

In the botanical garden of the University of Horticulture at Soroksár (Budapest XX<sup>th</sup> district), remains of Early Bronze Age (Late Nagyrév Culture) settlement and associated finds were found<sup>1</sup> in course of earth-moving works. The trench transecting the sand crest cut across five pits. In the pits, apart from a moderate amount of pottery, a large number of animal bones (primarily, cattle, 248 pieces) and other animal bones (66 pieces) were found (Table 1; material in the Budapest History Museum Inv. nr: 1<sup>st</sup> pit 71.1.9., 2<sup>nd</sup> pit 71.1.10, 3<sup>rd</sup> pit 71.1.50-52, 4a pit 71.1.68, 4b pit 71.1.67). The dimensions of the pits and the drawing on the cattle remains in pit No. 2. were taken from the study of Rózsa Schreiber.<sup>2</sup> A part of the animal remains were formerly published by Sándor Bökönyi.<sup>3</sup>

## 1. ANIMAL REMAINS

*Pit No. 1.* (western half of the pit, the rest as destroyed)

*cattle* - remains of an approx. 2 years old bull calf, altogether 13 pieces

*head:* skull (crashed), pair of mandibles, *limbs:* right side lower arm (d. rad.), lower leg on both sides (d. fem-tib-astg-mt, s. fem., mt.)

*Pit No. 2.* (diameter: 215 × 155 cm, depth: 245 cm)

*2/1 cattle:* an adult bull, 63 pieces

*head:* skull (partly crashed, deficient,<sup>4</sup> s. mandibula, *trunk:* cervical vertebrae (7 pieces), dorsal vertebrae (13 pieces), lumbar vertebrae (6 pieces), sacrum I., *limbs:* right side fore leg (d. hum-rad/ulna-c-mc-ph.I.II.) both hind legs (s. pelvis-fem-tib-astg/calc-mt., d. patella-tib-malleo-astg/calc/t-mt-ph. I.-II). The diameter of the pelvis acetabulum was 70 mm.

The remains of the cattle 2/1 were lying in the eastern half of the pit along the edge.<sup>5</sup> The skull was lying in southern direction on its row of teeth, the left side mandible was found under this turning to opposite direction. Behind the skull the complete vertebral column connected to the skull, bent in an arch comprising 7 cervical and 9 dorsal vertebrae. Beside this, on

the western side the rest of the dorsal vertebrae turned back (10-13 dorsal vertebrae); below this, the row of lumbar vertebrae (1-6), the lumbar bone and the left side pelvis. The right side hind leg (fem. under the cervical vertebrae) was in the southern third of the pit, the right side fore leg was lying in the northern third of the pit, oriented in W-E direction (Fig.1).

The skull and the horn core are of the primigenius type. The frontal region is wide and domed; the frontal ridge is slightly flatly pointed. The basis of the horn core has thin wall, large with oval cross-section. The frontal length (Ac-N) is 265 mm, its greatest width (Ect-Ect): 230 mm, the Sp-Sp distance: 130 mm. The distance between the lower margin of the horn core basis and the Ect. point is 110 mm. The half-distance of the upper part of the horn core is 90 mm, that of the lower part is 115 mm, the half of the fs-fs distance is 104 mm.

*Pathology:* In the left side dentition the chewing surface of the upper P1-3 lying beside each other slopes in a step-wise manner, located at different height. Due to the excess growth of the P3 (exsuperantia dentis), the crown of the lower M1 is abraded till the alveolus. This anomaly was caused by the different hardness of the teeth: the dental matter of the lower M1-2 teeth was soft. The rim of the alveolus at the teeth P<sup>1-3</sup>-M<sup>1</sup> was wavy, the crown of the P<sup>3</sup> was not abraded, its rear-side external root was wedged between the two frontal roots of the M1.

The rear-side spurs of the V<sup>th</sup> and the front spurs of the VI<sup>th</sup> cervical vertebrae (proc. articulares) are pathologically wide, their articular surface is loosened with cavities.

The exterior side of the left malleolar bone and the bone surface on the margin of the related tib.dist.lat. is deformed.

*2/2 cattle:* an adult ox, 8 pieces of bone

*head:* skull split in two, pair of mandibles; *limbs:* left side fore leg (s. scapula-hum-rad.)

The left side of the skull was at the right side of cattle 2/1 skull, to the west of it, above the fore leg (Fig. 1.), its right half together with the mandibles were in the SW third of the pit (Fig.1).

*2/3 cattle:* a not yet fully grown (subadult.) cow, 11 pieces of bone

*head:* right side brain skull with the horn core; *limbs:* right side fore leg (d.-hum.-rad./ulna-c-mc), left side

<sup>1</sup> KALICZ-SCHREIBER 1981; SCHREIBER 1984.

<sup>2</sup> SCHREIBER 1984.

<sup>3</sup> BÖKÖNYI 1984.

<sup>4</sup> BÖKÖNYI 1984. Fig. 1.

<sup>5</sup> SCHREIBER 1984. 3., 4.1-2. The drawing depicted a certain phase of the work when part of the remains were already collected.

pelvis (diam. acet. 58 mm). The short, arched, thick horn core is of the *brachyceros* type.

The remains of this animal were over and around the skull of cattle 2/2.

2/4 cattle: approx. 1-1,5 years old (inf.) bull calf, 9 pieces of bone

*limbs*: right side fore leg (d. hum-rad/ulna-c-mc-ph.I.-II.). The distal epiphyses of the humerus and the metacarpus and the proximal epiphyses of the phalangi are not ossified yet.

The remains of this animal were found over the skull of cattle 2/2 and to the west of it (Fig.1).

2/5 cattle: 5-6 month old calf, 22 pieces

*head*: skull (crushed), the horn core is small, compact and porous; the dentition contains dp1-3; *trunk*: cervical vertebrae (6 pieces), lumbar vertebrae (9 pieces with separate corpus and arches!)

In the SE corner of the pit, the skull without mandible was found in vertical position with the vertebral column connected to it in western direction.

2/6 cattle: not yet fully grown (subadult.) ox, 38 pieces

*head*: the head edge of the skull with the horn core, right side maxilla, *trunk*: 7 cervical vertebrae, connected and 9 dorsal vertebrae; *limbs*: both side fore legs (s.-d. hum-rad/ulna, s. c-mc-ph. I.), right side pelvis (diameter of acet. 65 mm), parts of right side hind leg (s. tip-astg.)

The frontal part of the skull is narrow, domed. The frontal ridge is wavy with two peaks.<sup>6</sup> The flat, thin horn cores turn forward. After the dimensions and form of the horn cores the skull represented a head type of mixed *primigenius-brachyceros* character.

The skull (without maxillae) was in the NE third of the pit, the arched vertebral column parts were located to the west of it. The ribs were detached from the vertebrae approx. at 10-15 cm from their proximal end. From the row of ribs, only 3 were collected. On both sides of the cranial articular surface of the atlas a deep V-shaped incision was found which was formed when it was detached from the skull. The left side fore leg was found in the middle of the pit in W-E direction over and beside the lumbar bone and pelvis of cattle 2/1, with a bent mc (Fig.1). Among the long bones, the proximal epiphysis of the hum.-ulna and the distal epiphysis of the radius were not ossified yet.

2/7 cattle: not yet fully grown (subadult.) cow, 13 pieces

*limbs*: parts of both side fore legs (d. hum-rad/ulna-c-mc-ph.I.-II., s. mc.) The right side fore leg was under the skull of cattle 2/1 and over the remains of the calf 2/5 in W-E direction (Fig. 1).

#### Other animals

There were 11 pieces of *sheep* bone remains (3 pairs of mandible, 2 rad. (juv-ad.), mc.fr., s.-d. tib.; fragment of right side facial skull of *pig* with M3, length 37 mm;

lower canine tooth of a *dog* and the frontal edge part of an antler hoe made of *red deer* antler.

Pit No. 3. (diameter: 160 × 175 cm, depth: 235 cm)

3/1-3 cattle - 3 oxen of different age, 37 pieces

*head*: parts of 3 skulls and 2 pair of mandibles; *trunk*: 2 cervical, 1 dorsal and 3 lumbar vertebrae, sacrum I. fr.; *limbs*: parts of two side fore legs (s. scapula, s.-d-rad/ulna, d. mc), left side pelvis, two side hind legs (s. fem-tib-t-mt, d. tib-astg-mt). On the ventral surface of the lumbar bone, oblique cut-marks could be observed. The dist. end of the right side mc. shows signs of carving.

Among the 3 cattle individuals, one is an approx. 1,5 year old calf (cattle 3/1). with dp1-3 M1, another 3 years old subadultus (cattle 3/2) and one adultus (ad.) ox. This latter was in the central part of the pit, in depth of 120-130 cm beside the skeleton of a *dog*.

#### Other animals

There were 3 individuals of *sheep* (rad/ulna, tib), 7 *pigs* (facial skull fr., 2 s. corp. mandibulae belonging to a subad. male and a matus female, hum., 2 fem (belonging to inf. subad.) and an astragalus. This latter bone belongs to a male pig, the wither height calculated from the length<sup>7</sup> is 86 cm!

There was also a medium size radius prox. fragment of a *horse* found here.

An incomplete skeleton of an adultus male *dog* was also found in the pit, comprising 32 pieces of bone. The left side cavity of the brain case and the occipital part was split and broken open. The right side lower and upper P2 teeth are missing, the alveolus is closed. The dog belongs to the large size Bronze Age form called *Canis familiaris matris optima* (Jeitteles 1877). The withers height of this dog, calculated<sup>8</sup> was 54,8 cm.

The bone finds comprised also a shaft-hole antler hoe and a bone awl.

Pit No. 4a. (diameter: 150 × 135 cm, depth: 260 cm)

4a/1-3 cattle - 3 individuals of different age, 29 pieces

*head*: 3 left side mandibles (s. mandibula fr.); *trunk*: fragments of 2 cervical and 2 dorsal vertebrae; *limbs*: parts of 4 fore legs, two left side ones (s. scapula-hum-rad/ulna-mc, s. rad.-mc), two right side ones (d. rad-mc, d. mc), parts of three hind legs (s. fem-tib, 3 d. mt. 1 ph.II.).

The cattle remains belong to an approximately 2 years old female calf (cattle 4a/1, juv.) and two adultus oxen (ad., cattle 4a/2-3).

#### Other animals

There were bones of 5 adultus *sheep* here (pair of mandibles, d. mandb. fr., s. scapula, tib. fr.), 1 juvenile *pig* (represented by hum. diaph.) and an adultus *dog* (s. mandibula, with P2 grown cross-wise).

<sup>7</sup> on the basis of TEICHERT 1969.

<sup>8</sup> on the basis of KOUDELKA 1886.

<sup>6</sup> BOKONYI 1984. fig. 2.

The animal bone remains were in the western half of the pit, in the fill-up sediments over a human skeleton in contracted position.

*Pit No. 4b.* (diameter: 120 × 150 cm, depth: 260 cm)

*cattle:* adultus cow, 5 pieces of bone

*head:* fragment of right side mandible; *trunk:* fr. of cervical vertebra; *limbs:* left side fore leg, distal parts (s. mc-ph. I.-II.)

Other animals

left side pelvis fragment of *horse* (diam. of acet. 63 mm)

## 2. SACRIFICIAL ANIMALS

### Cattle

The anatomical distribution of the cattle remains excavated in the five pits at Soroksár-Botanical Garden shows a uniform pattern (Table 2.)

*head-part:* in 13 instances, skull and/or mandible + others only head-part and pieces of vertebrae (2/5., 3/1.)

*trunk:* in 3 instances, connected parts of the vertebral column (2/1., 5., 6.) or pieces of vertebrae (3., 4a-b.)

*limbs:* fore and hind legs + head-part in 7 instances (1, 2/1., 2/6, 3/2-3, 4a/2-3).

only fore leg in two cases (2/4., 7.),

fore leg + head parts in 3 instances (2/2., 3., 4b),

hind leg + head part in one case (4a/1).

The cattle was butchered on 'brja', i.e., the vertebral column was cut together with the skull from the body of the animals. This was either performed by immediately cutting that from the dorsal vertebrae or splitting the row of ribs with the chest along the two sides of the carcass turned to its back, in a distance of 10-15 cm from the vertebrae. The skulls were typically split and the pair of mandibles cut off from the head. The trunk was detached of the fore limbs and the pelvis was detached of the hind limbs. Both the connected and the separate leg bones show that the meat was not cut off from them. The cutmarks found on the individual bones were made during the butchering of the animals.

In course of the sacrificial process, similar to the examples known from the Late Copper Age, the animals were butchered, the offal detached than the carcass cut in pieces. The meat was not detached from the limbs which were placed into the pit, probably the persons who took part in the rite did not taste the meat. Complete animal was not placed into the pit with the exception of a dog. The head, or part of it, as an attribute for the animal was placed into the Soroksár pits with the exception of two instances.

Among the sacrificed cattle we find both sexes as well as castrated work-animals. Of the 15 cattle individuals we find:

4 cows (2/3., 7., 4a/1, 4b)

3 bulls (1., 2/1., 4.)

7 oxen (2/2., 6., 3/1-3, 4a/2-3)

1 calf ? (2/5.)

The high number of oxen in the sample cannot be surprising as their power was badly needed as draught both in transport and agriculture.

Looking at their distribution by age, we find an interesting phenomenon. From the animals reaching their age of propagation, i.e., more than 3 years, 1 bull, 3 cows and 6 oxen were butchered. Among the calves, there were remains of 2 male, 1 female and one castrate individuals as well as a young calf of 5-6 months.

The calculated height of the cattle<sup>9</sup> is given in Table 3 (withers height) and Table 4 (bone dimensions).

The Soroksár Early Bronze Age cattle were of large dimensions: the average withers height values were:

cow	2 individuals	4 bones:	112,8 cm
bull	1 individual	4 bones:	131,2 cm
bull calf	1 individuals	1 bone:	128,7 cm approx. 2 years old
bull calf	1 individuals	2 bones:	110,1 cm approx. 1-1,5 years old
ox	3 individuals	5 bones:	123,7 cm

### Sheep

Among the 5 individuals, there was 1 juvenile and 4 adultus animals. The pits yielded only the head and the fleshy limb parts of the sheep.

### Dog

The sacrificial role of the dog with broken skull is highly probable.

The role of pig and horse remains in the sacrificial ceremony is not clear.

As a conclusion we can say that the individual sacrificial pits comprised the following animals:

Pit 1: bull calf

Pit 2: 7 cattle individuals - calf, bull calf, 2 cows and 2 oxen  
2 sheep

Pit 3: 3 cattle - all of them oxen  
1 sheep, 1 dog

Pit 4a: 3 cattle - 1 female calf, 2 oxen  
2 sheep

Pit 4b: cow.

In course of the excavation a thick burnt ashy layer was observed on the bottom of pits Nos. 2. and 3., and the animal remains were above them. In pit 2., a black ashy layer was observed above the animal bones as well.<sup>10</sup> The surface of certain cattle bones was burnt brownish-black.

The stratigraphical position of the animal remains in pit No. 2. allows the reconstruction of the following order in the process: first, the parts of 2., 3., 4. (ox-

<sup>9</sup> after MATOLCSI 1970.

<sup>10</sup> SCHREIBER 1984. 131.

-cow-bull) individuals were placed into the S-W third of the pit; remains of the calf 5. were placed in the southern corner of the pit (mortality date can be ascertained for autumn - September/October), followed by parts of individuals 7. and 1., finally 6 (cow-bull-ox). The vertebral column of individual No.1. was thrown from the eastern side into the pit with bottom part ahead than the head was pushed to the south. At this point, the vertebral column was torn into two between the 9<sup>th</sup> and 10<sup>th</sup> dorsal vertebrae.

Remains similar to the Soroksár cattle sacrifice finds were found at Csongrád-Vidre island, from pit No. 55

belonging to Vatyá Culture:<sup>11</sup> in a small oval pit, skull, vertebral column (7 cervical, 9 dorsal and 6 lumbar vertebrae) and two side hind legs (s.-d. pelvis-fem-tib-astrag./calc., d. mt.-ph.I.-II.-III) were placed. There was also an antler stem fragment (?) (not mentioned in the description) of the finds.

This custom was seemingly surviving the Bronze Age at some places. For example at Ozora in the house no. 2 (Urnfield Culture), section XII/A 2., 7 goat skeletons and a split cattle with connected limb bones and chest-part without the vertebral column were found.<sup>12</sup>

### BIBLIOGRAPHY

- |                       |   |
|-----------------------|---|
| BÖKÖNYI 1984          | BÖKÖNYI S.: A soroksári botanikus kertben feltárt korabronzkori áldozati gödrök állatmaradványai. <i>BudRég</i> 26. (1984), p. 145-151.   |
| KALICZ-SCHREIBER 1981 | KALICZ-SCHREIBER, R.: Opfergruben aus der Frühbronzezeit in der Umgebung von Budapest. <i>SIA</i> 29. (1981), p. 75-86.   |
| KOUDELKA 1886         | KOUDELKA, F.: Das Verhältniss der Ossa longa zur Skelethöhe bei den Säugethieren. <i>Verhandl. d. Naturforsch. Ver. Brünn</i> 24. (1885) [1886], p. 127-153.  |
| MATOLCSI 1970         | MATOLCSI, J.: Historische Erforschung der Körpergrösse des Rindes auf Grund von ungarischem Knochenmaterial. <i>Zeitschrift f. Tierzucht u. Züchtungsbiol.</i> 87. 2. (1970), p. 89-137.                                |
| SCHREIBER 1984        | SCHREIBER, R.: Korabronzkori település maradványai a soroksári botanikus kertben. <i>BudRég</i> 26. (1984), p. 131-143.   |
| SZÉNÁSZKY 1977        | SZÉNÁSZKY J.: A vatyai kultúra leletei Csongrád környékén. <i>ArchÉrt</i> 104. (1977), p. 18-46.  |
| TEICHERT 1969         | TEICHERT, M.: Osteometrische Untersuchungen zur Berechnung der Wideristhöhe bei vor- und frühgeschichtlichen Schweinen. <i>Kühn Archiv</i> 83.3. Halle-Wittenberg, 1969. p. 237-292.                                    |
| VÖRÖS 1988            | VÖRÖS, I.: Késő bronzkori állatáldozat a várkastély területén. In: Feld I. et al.: Jelentés az ozorai várkastélyban és környékén 1981-85-ben végzett régészeti kutatásról. <i>BÁMÉ</i> 14. (1988) p. 271-273., 288-294. |

<sup>11</sup> wrongly described as horse, SZÉNÁSZKY 1977. 22. Fig. 5.

<sup>12</sup> VÖRÖS 1988. 271-272. 26 fig. 2.

## KORABRONZKORI SZARVASMARHA ÁLDOZATOK MARADVÁNYAI SOROKSÁRON

A Kertészeti Egyetem soroksári (Budapest, XX. ker.) Botanikus kertjében 1969-ben földmunkálatok során öt korai bronzkori (késő nagyrévi kultúra) gödör került elő.

1. gödör: szarvasmarha – ca. 2 éves bika borjú – 13 db maradványa,

2. gödör: szarvasmarha 7 (1. kép),

2/1. adultus bika – 63 db maradványa,

2/2. adultus ökör – 8 db maradványa,

2/3. subadultus tehén – 11 db maradványa,

2/4. infantilis bika borjú (1–1,5 éves) – 9 db maradványa,

2/5. infantilis borjú (5–6 hónapos) – 22 db maradványa,

2/6. subadultus ökör – 38 db maradványa,

2/7. subadultus tehén – 13 db maradványa.

3. gödör: 3/1–3. különböző életkorú ökör – 37 db maradványa,

4a. gödör: 4a/1–3. különböző életkorú egyed – 29 db maradványa,

4b. gödör: adultus tehén – 5 db maradványa.

Az állatsontanyag gödrönkénti megoszlását az 1., az áldozati szarvasmarhák csont maradványainak anatómiai megoszlását (2. kép) a 2., a csontméreteket a 3. és 4. táblázat tartalmazza.

A koponya és a szarvcsapok alapján a 2/1. szarvasmarha primigenius, a 2/3. brachyceros, és a 2/6. „kevert” primigenius–brachyceros típusú. A 2/1. szarvas-

marha fogsora lépcsőzetesen kopott, a sin. p3 túlnőtt (exsuperentia dentis). A 2/6. szarvasmarha atlasának craniális ízületi felületén mindkét oldalon – a koponyáról való leválasztásakor keletkezett – mély V-alakú vágás található. A 3. gödörben egy kan kutya hiányos csontváza is volt.

A szarvasmarhákat „orjára” bontották, azaz a gerincoszlopot a koponyával együtt hasították ki az állat testéből. A törzsről a mellső, a medencéből a hátulsó lábakat távolították el.

A szarvasmarhák nagy testméretűek voltak, az átlag marmagassági értékek:

2 tehén 112,8 cm, 1 bika 131,2 cm, 2 bika borjú 110,1–128,7 cm, 3 ökör 123,7 cm.

A 2. és 3. gödör alján égett hamus réteg volt, fölötte voltak az állatmaradványok.

A 2. gödörbe először a 2., 3. és 4. (ökör–tehén–bika) állatrészeket; majd az 5. borjú (ősz–szept./okt. mortalitás!) maradványait; majd a 7. az 1. és végül a 6. egyed (tehén–bika–ökör) testrészei kerültek.

Hasonló szarvasmarha áldozat maradványa ismert Csongrád–Vidra sziget 55. vatyai kultúras gödörből, illetve későbből Ozora XII/A.2. szelvény 2. Urnamezős kultúra házából, ahol 7 kecske és egy széthasított szarvasmarha csontváz részei voltak.



Fig. 1. Soroksár-Botanical Garden 1969. pit No. 2. Skeletal parts of cattle 1-7. in situ

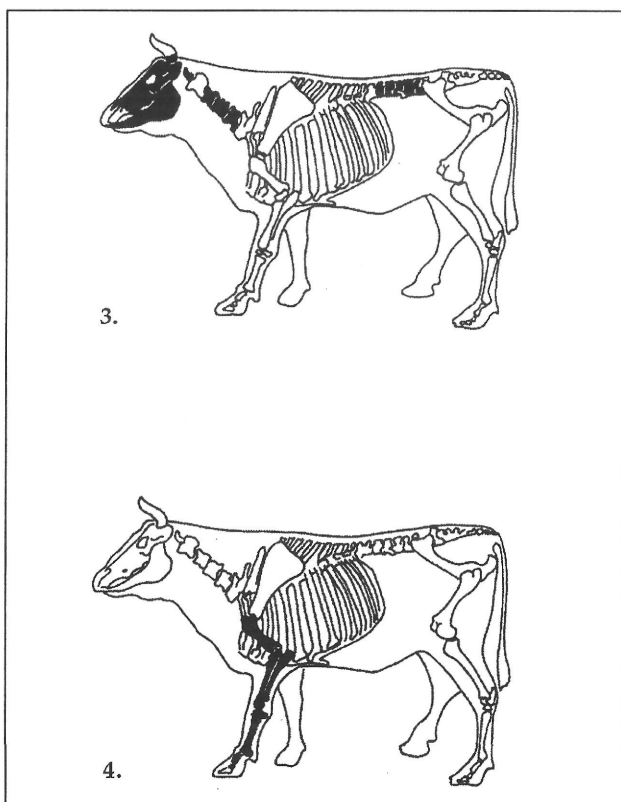
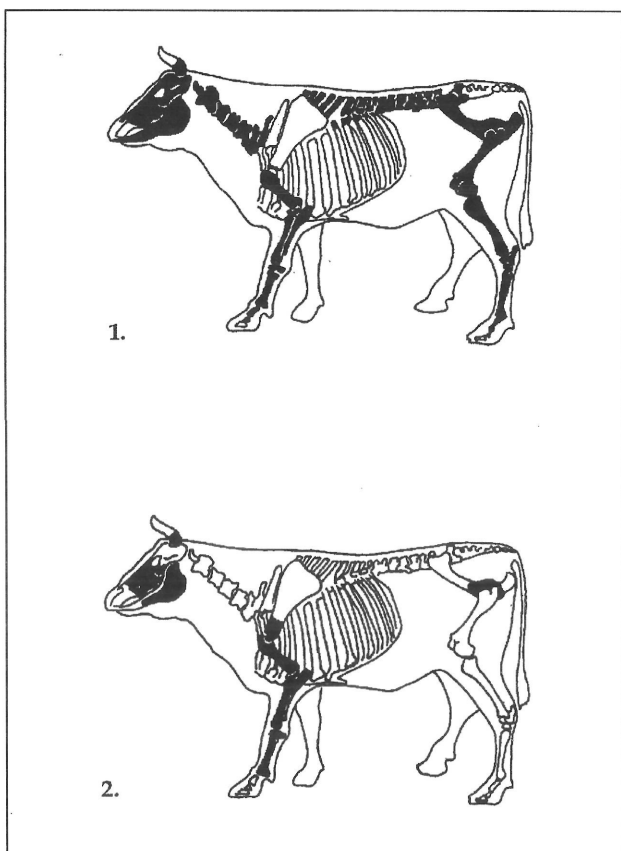


Fig. 2. Soroksár-Botanical Garden 1969. pit No. 2. Anatomical position of cattle skeletal parts: 1. cattle 2/1, 2/6; 2. cattle 2/2, 2/3, 4b; 3. cattle 2/5, 3/1, 4. cattle 2/4, 2/7 (Drawing by Ágnes Vári, Hungarian National Museum)

Species/Objects	1.	2.	3.	4a.	4b.	Total
Cattle	13	164	37	29	5	248
Sheep	-	11	3	5	-	19
Pig	-	1	7	1	-	9
Horse	-	-	1	-	1	2
Dog	-	1	32*	1	-	34
	13	177	80	36	6	312
Red deer	-	1	1	-	-	2
Total	13	178	81	36	6	314

\* - Skeleton

Table 1. Soroksár-Botanical Garden 1969. Animal remains (Number of specimens)

SACRIFICIAL CATTLE REMAINS FROM THE EARLY BRONZE AGE SETTLEMENT AT SOROKSÁR

Bones/Cattle Nr.	1.	2/1.	2/2.	2/3.	2/4.	2/5.	2/6.	2/7.	3/1-3.	4a/1-3.	4b.
brain skull	3	1	-	1	-	5	1	-	3	-	-
facial skull	1	3	2	-	-	2	1	-	-	-	-
mandibul	2	1	2	-	-	-	-	-	4	5	1
Tooth	-	-	-	-	-	-	-	-	-	3	-
vert.	-	27	-	-	-	15	16	-	7	4	1
Costa	-	-	-	-	-	-	3	-	-	-	-
Scapula	-	1	-	-	-	-	-	-	1	1	-
Humerus	-	2	1	1	1	-	2	1	-	1	-
Radius	1	1	1	1	1	-	3	1	2	3	-
Ulna	-	1	-	1	1	-	2	1	1	1	-
Carpus	-	2	-	5	2	-	4	3	-	-	-
metacarpus	-	1	1	1	1	-	1	2	1	4	1
Pelvis	-	1	-	1	-	-	1	-	3	-	-
Femur	2	1	-	-	-	-	-	-	2	4	-
Patella	-	1	-	-	-	-	-	-	-	-	-
Tibia	1	3	-	-	-	-	2	-	3	2	-
malleolare	-	1	-	-	-	-	-	-	-	-	-
astragalus	1	2	-	-	-	-	1	-	1	-	-
calcaneus	-	2	-	-	-	-	-	-	-	-	-
Tarsus	-	2	-	-	-	-	-	-	1	-	-
metatarsus	2	2	-	-	-	-	-	-	2	3	-
o.ph.I.	-	4	-	-	2	-	1	4	-	-	-
o.ph.II.	-	4	-	-	1	-	-	1	-	1	1
	13	63	8	11	9	22	38	13	37	29	5

Table 2. Soroksár-Botanical Garden 1969. Anatomical distribution of the sacrificial cattle remains (Number of specimens)

Nr.		radius		metacarpus		tibia		metatarsus		Wh.
2/1.	bull ad.	310	133,3	204	129,2	337	130,0	235	132,0	131,2
1.	bull juv.							229	128,7	128,7
2/2.	ox ad.	285	122,5							122,5
2/3.	cow subad.	250	109,6							109,6
2/4.	bull inf.	240	103,2	194	117,0					110,1
2/6.	bull subad.	296	127,3	200	126,6					127,0
2/7.	cow subad.	270	116,2	187	112,8					114,0
4a/2.	ox ad.							213	119,7	119,7
4a/3.	ox ad.							218	122,5	122,5

Table 3. Soroksár-Botanical Garden 1969. Withers height of cattle (in cm)

ISTVÁN VÖRÖS

<u>Horn core</u>	Length	gratest diameter	smallest diameter	circumference of the basis					
1.	-	58	46	158				bull juv.	
2/1.	-	73	56	210				bull ad.	
2/3.	193	49	38	136				cow subad.	
2/6.	-	68	47	183				ox subad.	
	-	66	45	178					
3/2.	-	60	45	162				ox subad.	
<u>Humerus</u>		1.	2.	3.	4.	5.	6.	7.	8.
2/1.		-	-	41	90	-	46	88	
2/2.		-	-	36	77	-	39	78	
2/4.		-	-	27	72	-	33	74	inf.
2/6.		-	86	36	80	110	43	83	
2/7.		-	-	-	74	-	-	75	
<u>Radius</u>									
1.		-	-	-	78	-	-	45	juv.
2/1.		310	86	46	83	42	26	48	133,3
2/2.		285	83	40	69	42	23	45	122,5
2/3.		250	74	36	65	35	18	40	109,6
2/4.		240	74	32	72	39	19	44	103,2 inf.
2/6.		296	84	41	77	44	24	47	127,3
2/7.		270	76	38	66	39	21	42	116,2
3.		-	80	-	-	42	-	-	
4a.		-	-	-	70	-	-	44	
<u>Metacarpus</u>									
2/1.		204	65	40	69	40	24	35	129,2
2/4.		194	56	28	56	34	20	34	117,0 inf.
2/6.		200	62	34	64	37	23	34	126,6
2/7.		187	55	33	59	35	20	30	112,8
		187	56	32	59	36	20	29	112,8
3.		-	-	-	65	-	-	-	
4a/1.		-	54	-	-	33,5	-	-	
4a/2.		-	-	-	63	-	24	32	
4a/3.		-	-	-	68	-	24	34	
4b.		-	-	-	55	-	-	29	
<u>Femur</u>									
2/1.		(385)	-	42	104	-	43	128	
<u>Tibia</u>									
1.		-	-	-	60	-	-	43	
2/1.		337	103	44	69	93	28	50	130,0
		-	-	-	68	-	-	50	
2/6.		-	-	-	67	-	-	42	
4a.		-	-	-	65	-	-	48	

Table 4. Soroksár-Botanical Garden 1969. Measurements of cattle bones (in mm)

SACRIFICIAL CATTLE REMAINS FROM THE EARLY BRONZE AGE SETTLEMENT AT SOROKSÁR

<u>Metatarsus</u>									
1.	229	46	25	57	45	24	32	128,7	juv.
	-	-	-	54	-	-	29		
2/1.	235	54	32	65	49	24	34	132,0	
	-	53	-	-	49	-	-		
3.	-	-	-	60	-	-	33		
4a/1.	-	-	-	51	-	-	29		juv.
4a/2.	213	50	29	59	45	26	31	119,7	
4a/3.	218	46	26	50	42	23	31	122,5	
<u>Os ph.I.</u>									
2/1.	55	32	26	30	31	18	22		
	55	32	29	31	34	21	23		
	56	32	26	31	34	20	23		
	57	32	26	30	32	20	23		
2/4.	52	27	22	25	28	16	18		inf.
	52	27	22	26	30	18	22		inf.
2/6.	53	30	25	29	32	19	22		
2/7.	45	29	24	27	27	17	20		
	48	30	26	28	28	17	20		
	49	30	27	29	28	17	20		
	50	28	24	27	28	18	21		
<u>Os ph.II.</u>									
2/1.	33	30	24	28	30	23	30		
	35	28	22	26	32	25	-		
	37	31	25	26	32	24	-		
	37	32	27	28	34	22	-		
2/4.	35	28	22	-	32	23	-		
2/7.	35	29	23	23	30	21	28		
4a.	34	29	22	22	31	22	28		
4b.	40	33	27	30	38	25	37		
<u>Astragalus</u>									
		length		breadth		height (in mm)			
1.		67		46		36		juv.	
2/1.		68		46		40			
		68		46		39			
2/6.		62		44		35			
3.		62		43		34			
<u>Calcensus</u>									
2/1.		144		48		55			
		145		48		56			

- |  |                           |
|--|---------------------------|
| 1. length (fem - from the caput femoris) | 5. prox. epiph. diameter  |
| 2. prox. epiph. breadth                  | 6. smallest diaph. d.     |
| 3. smallest diaph. br.                   | 7. dist. epiph. d.        |
| 4. dist. epiph. br.                      | 8. Withers height (in cm) |

Table 4. Soroksár-Botanical Garden 1969. Measurements of cattle bones (in mm)