

ANIMAL REMAINS FROM THE ROMAN FORUM OF
SOPRON-SCARBANTIA

INTRODUCTION

The latest excavations of the Roman Forum of Sopron (Scarbantia) situated in the inner part of this town of West Hungary which were carried out by Dr. J. Gömöri, the archaeologist of the local Liszt Ferenc Museum¹ added a lot to our knowledge about the centre of the late Roman town. Nevertheless, the excavations in question were particularly important from the viewpoint of the economic history of the Roman town for this time the animal remains were also collected and their study might throw light on two important sectors of the economic life, the animal husbandry and the hunting respectively.

Regarding the animal husbandry and hunting of the European provinces of the Roman Empire there are a lot of scattered data known. Since the last decades of the 19th century several smaller or larger works (up to the level of doctoral dissertations) have dealt with the animal remains of Roman provincial sites. Lately, four monographs² evaluated the animal bone assemblages of one or several Roman provincial sites giving a detailed economic historical analysis about them and even discussing their wider interactions.

In a sharp contrast with the above facts, we hardly know anything about the animal husbandry of Italy thus the centre of the Empire, from biological sources not mentioning the thorough report of Blanc and Blanc on the animal remains of the Niger Lapis on the Forum of Rome³ and some smaller publications by Riedel.⁴ And it is so in spite of the fact that O. Keller published his standard and still usable two-volume work "Die antike Tierwelt"⁵ that contained an immense amount of written data and artistic representations concerning the domestic and wild animals of the antiquity. In this way such a strange situation has developed that nowadays we know essentially more about the animal husbandry and domestic animals of the provinces of the Roman Empire than about those of the centre of the Empire itself and we are painstakingly trying to identify the domestic breeds found and osteologically described in course of provincial excavations with those in the descriptions of antique authors.

The situation outlined above can only have one explanation: in Italy the excavations have yielded archaeological finds in such a big quantity and high artistic quality that the excavators have not been interested in such banal finds as animal bones for a long time. Nowadays, however, when the interest of archaeologists has turned towards economic historical questions

¹J. GÖMÖRI: Scarbantia foruma, I—II. SSz 39 (1985) 1—24, 97—118.

²JOURDAN (1976) 1—338; KOKABI (1982) 1—146; BÖKÖNYI (1974) 10—238; R.-M. LUFF: A zooarchaeological study of the Roman north-western provinces. BAR Intern. Ser. 137, Oxford 1982, 1—338.

³G. A. BLANC—A. C. BLANC: Il Bove della stipe votiva del Niger Lapis del Foro Romano. BullPrehist-Ital, 12 (1958—59) 7—57.

⁴A. RIEDEL: I mammiferi domestici della grotta N 1745/4558 V. G. e di faune oloceniche minori. Atti e Mem. d. Comm. Grotte "Eug. Boegan", 13 (1974) 53—88; La fauna del castelliere degli Elleri (Trieste). Atti Mus. Civ. Stor. Nat. Trieste, 29 (1976) 105—122.

⁵KELLER (1909) 1—434; (1913) 1—617.

the collection of animal remains has already started at Italian excavations too, and their study can easily bring surprising results.

The animal bone assemblage of the Forum of Scarbantia is important not only because it is another Roman urban sample that obviously had strong Italian connections but also because it comes from the Late Roman period (from the 2nd half of the 4th c. to the 6th c. A. D.) thus from an era, when the town — willingly or unwillingly — had strong contacts with the Barbaricum too and the influence of these contacts might be observed in the animal husbandry as well. And while in the Roman town of TÁC-Gorsium one could first of all study the interactions of aboriginal and Italian animal husbandries and particularly the strong forming power of the latter one, in Scarbantia one can witness the encounter of a domestic stock improved under Italian influences and another one from behind the limes, in fact representing a late prehistoric stage of animal husbandry.

THE ANIMAL BONE SAMPLE

The excavations of the Forum of Sopron (Scarbantia) yielded a medium large, nevertheless, solidly evaluable animal bone assemblage. It is a typical settlement sample in that complete skeletons, larger body parts with bones in anatomical order and complete skulls were missing, and in fact one complete dog brain-skull, one incomplete cattle brain-skull and four larger cattle and one goat brain-skull fragments were found. The number of the complete horn-cores and larger horn-core fragments is also small but the complete long bones are certainly more numerous reaching 38 (*see Table 1.*).

The above Table shows that mainly the bones of the distal extremity segments survived in their whole length what is easily understandable if one takes into consideration that these, bones are short in comparison to the others thus they fit in the cooking pots on the one hand and they contain very little marrow and their walls are thick and compact and it was not much sense to break them up on the other. The survival of the cattle and goat metapodials is a lucky situation because in these species the withers height can only be determined from the length of these bones; in the case of other domestic species the other long bones can also be used for this purpose.

In general, the bones are very well preserved showing a few cut marks (and sawing marks on three antler fragments) and chewing marks (by dogs). Nevertheless, the number of measurable bones is rather low because the butchering was rather rude.

The occurrence of the different kinds of bones of the mammal species and their frequencies are shown on *Table 2.*

Table 2 reveals several things. First of all the complete lack of carpal bones and the small number of teeth are conspicuous. The first one goes back to the insufficiency of recovery and the explanation for the second is the fact that among the domestic animals that represent the overwhelming majority of the fauna the adult and mature ones are most frequent (*see Table 6*) whose teeth firmly sit in their alveoli while those of the immature ones stand loose and fall out easily. The number of the vertebrae is also conspicuously low and this is connected with the butchering technique (they are longitudinally cut into two parts except for the cervical vertebrae that carry little flesh and there is therefore no sense to split them, consequently their number is much higher than that of the other ones) and with difficulties in their species identification as a result. The toe bones are rare, too, but its reason is clear: the animals were certainly not butchered on the Forum or in its immediate vicinity, and as a result these meatless skeletal parts rarely reached the houses near the Forum probably inhabited by well-to-do people. In fact most of the bones come from the best meat regions of the carcasses. The frequency of the mandibles is conspicuously

high because they were removed along with the tongue, a delicacy in those times too, and the naso-facial fragments also meant the bony backgrounds of favourite meat kinds. The bones of the proximal extremity segments carrying larger amounts of meat were almost totally cut into pieces.

Table 1
The complete long bones

| | Humerus | Radius | Meta- carpus | Femur | Tibia | Meta- tarsus | Total |
|---------|---------|--------|-----------------|-------|-------|-----------------|-------|
| Cattle | — | 4 | 15 | — | — | 10 | 29 |
| Sheep | — | — | 1 | — | — | — | 1 |
| Goat | — | — | 1 | — | — | — | 1 |
| Horse | — | — | 2 | — | 1 | 1 | 4 |
| Dog | 1 | — | — | 1 | — | — | 2 |
| Aurochs | — | — | — | — | — | 1 | 1 |
| Total | 1 | 4 | 19 | 1 | 1 | 12 | 38 |

Table 2
The occurrence of bone finds of the mammal species and their frequencies

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Total |
|-------------------|-----|----|----|----|---|---|---|---|---|----|----|-------|
| Horn-core+ antler | 17 | 14 | — | — | — | — | — | 5 | 1 | — | — | 37 |
| Skull | 136 | 3 | 32 | 9 | — | 2 | — | — | — | — | — | 182 |
| Upper tooth | 14 | 2 | 2 | 1 | — | — | — | — | — | — | — | 19 |
| Mandible | 111 | 24 | 54 | 11 | 1 | — | — | 1 | 1 | — | 1 | 204 |
| Lower tooth | 17 | 3 | 18 | 9 | — | — | — | — | — | 2 | — | 49 |
| Cervical vertebra | 24 | 3 | 6 | 12 | — | — | 1 | — | — | — | — | 46 |
| Thoracal vertebra | 4 | 1 | 1 | — | — | — | — | — | — | — | — | 6 |
| Lumbar vertebra | 3 | 2 | 1 | — | — | 1 | — | — | — | — | — | 7 |
| Os sacrum | 2 | — | — | — | — | — | — | — | — | — | — | 2 |
| Caudal vertebra | 1 | — | — | — | — | — | — | — | — | — | — | 1 |
| Rib | 89 | 5 | 25 | 13 | — | 5 | — | — | — | — | — | 137 |
| Scapula | 62 | 6 | 20 | 4 | — | — | 1 | — | — | 1 | — | 94 |
| Humerus | 39 | 9 | 17 | 8 | — | 1 | 1 | — | 2 | 1 | 1 | 79 |
| Radius | 44 | 22 | 13 | 6 | — | 2 | 2 | — | — | 1 | — | 90 |
| Ulna | 39 | 13 | 16 | 1 | — | 2 | — | — | 1 | 2 | — | 74 |
| Metacarpus | 69 | 11 | 6 | 6 | — | — | — | — | — | — | — | 92 |
| Pelvis | 42 | 3 | 8 | 1 | — | 3 | — | — | — | — | — | 57 |
| Femur | 66 | 6 | 7 | 3 | — | 5 | 1 | 1 | — | — | 1 | 90 |
| Patella | 1 | — | — | — | — | — | — | — | — | — | — | 1 |
| Tibia | 52 | 27 | 16 | 11 | — | 1 | — | — | — | 1 | — | 108 |
| Fibula | — | — | 4 | — | — | — | — | — | — | 1 | — | 5 |
| Tarsal | 39 | 2 | 4 | 4 | — | — | — | — | — | — | — | 49 |
| Metatarsus | 69 | 10 | 5 | 2 | 1 | 1 | 1 | 1 | — | — | — | 90 |
| Phalanx I | 23 | — | 1 | 6 | — | — | — | — | — | — | — | 30 |
| Phalanx II | 19 | — | — | — | — | — | — | — | — | — | — | 19 |
| Phalanx III | 15 | — | — | 6 | — | — | — | — | — | — | — | 21 |

1. cattle
2. sheep/goat
3. pig
4. horse
5. cat

6. dog
7. aurochs
8. red deer
9. roe deer
10. wild swine

11. brown hare

4 cattle radii, a horse tibia and a dog humerus and femur respectively are the only exceptions, nevertheless, the meat of the last two species was hardly consumed. At the same time, the almost totally meatless metapodials are mainly intact or are only cut in the middle: they were obviously used for making soups alone.

THE FAUNA

The fauna identified from the animal remains of the Forum of Sopron (Scarbantia) is rather ambiguous. While the domestic fauna is rich in species containing altogether eight species and in fact, every common Roman domestic species — except the ass — is occurring in it, one the one hand, in the wild fauna there can only be found the four usual ungulates — aurochs, red deer, roe deer, wild swine — plus the brown hare and one or two fish species (the carnivores are totally missing) on the other.

Among the domestic animals the cat — according to our most recent knowledge — was first imported into the Carpathian Basin by the Romans,⁶ the hen was brought by the Scythians and made frequent by the Celts.⁷ As a matter of fact, these two peoples put down the groundstone of the modern animal husbandry whose most frequent species is the hen — at least as regards the number of individuals. The goose can easily have been domesticated by the Romans too — as well as by other peoples because its wild form lives in a very large area. In any case, it was already known from imperial Roman sites in Germany⁸ and at the same time it reached Pannonia too.⁹

Regarding the frequencies of the main domestic species in the sample, looking at the numbers of specimens, cattle make up 2/3 followed by pig, sheep/goat and horse in this order, the other domestic species are quite rare (*see Table 3*). Nevertheless, looking at the number of individuals cattle, although being the most frequent species do not make up 1/3 of all domestic animals. Pig is just slightly less frequent than cattle but the caprovines are far behind the two leading species, and horse, dog and domestic fowl do not play an essential role in the animal husbandry.

Out of the sites of the Roman Imperial Period in Hungary caprovines were on the second place and pigs on the third (though the difference between them was very small) both in the enormously large sample of TÁC-Gorsium¹⁰ and the much smaller one of Balatonaliga.¹¹ In Budapest-Albertfalva¹² and Pilismarót-I. Órtorony¹³ the ratio between caprovines and pigs was just the opposite behind the leading cattle.

As regards other European sites of the Roman Empire, Valkenburg (the Netherlands),¹⁴ Abodiacum,¹⁵ Butzbach,¹⁶ Cambodunum,¹⁷ Hüfingen,¹⁸ Künzig-Quintana,¹⁹ Lauriacum,²⁰ Regens-

⁶ BÖKÖNYI (1974) 311; (1984) 14.

⁷ S. BÖKÖNYI: The development and history of domestic animals in Hungary: the Neolithic through the Middle Ages. *Am. An.* 73, 3 (1971) 51 f; BÖKÖNYI (1974) 35.

⁸ O.-F. GANDERT: Zur Abstammungs- und Kulturgeschichte des Hausgeflügels, insbesondere des Haushuhnes. *Wiss. Abh. d. Deutsch. Akad. d. Landwirtschaft. zu Berlin* 6, I (1953) 77.

⁹ BÖKÖNYI (1984) 15.

¹⁰ BÖKÖNYI (1984) 15.

¹¹ BÖKÖNYI (1974) 344.

¹² BÖKÖNYI (1974) 351.

¹³ BÖKÖNYI (1974) 392.

¹⁴ A. T. CLASON: Some remarks on the faunal remains from the Roman castellum at Valkenburg, province of South Holland. *Palaeohistoria*, 8 (1961) 139—147.

¹⁵ J. BOESSNECK: Die Tierknochenfunde aus den Grabungen 1954—57 auf dem Lorenzberg bei Epfach. *In: J. WERNER: Abodiacum-Epfach*. München 1964, 222.

¹⁶ K. H. HABERMEHL: Die Tierknochenfunde im römischen Lagerdorf Butzbach. *SJ*, 16 (1957) 68.

¹⁷ J. BOESSNECK: Tierknochen (von Cambodunum). *MhBV*, 9 (1953) 104.

¹⁸ A. SAUER-NEUBERT: Tierknochenfunde aus der römischen Zivilsiedlung in Hüfingen, II. Wild- und Haustierknochen mit Ausnahme der Rinder. *Diss. München*, 1968, 4.

¹⁹ W. SWEGAT: Die Tierknochenfunde aus dem römischen Kastell Künzig-Quintana. *Diss. München* 1976, 9.

²⁰ R. MÜLLER: Die Tierknochenfunde aus den spätrömischen Siedlungsschichten von Lauriacum, II. Wild- und Haustierknochen ohne die Rinder. *Diss. München* 1967, 8/a.

Table 3
The fauna list

| | Specimen | % | Individual | % |
|------------------------------------------|----------|--------|------------|--------|
| Cattle — <i>Bos taurus</i> L. | 997 | 63.10 | 37 | 31.62 |
| Sheep — <i>Ovis aries</i> L. | 166 | 10.51 | 23 | 19.66 |
| Goat — <i>Capra hircus</i> L. | | | | |
| Pig — <i>Sus scrofa dom.</i> L. | 256 | 16.20 | 33 | 28.21 |
| Horse — <i>Equus caballus</i> L. | 113 | 7.15 | 9 | 7.69 |
| Cat — <i>Felis domestica</i> Briss. | 2 | 0.13 | 2 | 1.71 |
| Dog — <i>Canis familiaris</i> L. | 23 | 1.45 | 6 | 6.13 |
| Hen — <i>Gallus domesticus</i> L. | 17 | 1.08 | 5 | 4.27 |
| Goose — <i>Anser domesticus</i> L. | 6 | 0.38 | 2 | 1.71 |
| Domestic animals | 1580 | 100.00 | 117 | 100.00 |
| Aurochs — <i>Bos primigenius</i> Boj. | 7 | 20.59 | 3 | 17.65 |
| Red deer — <i>Cervus elaphus</i> L. | 8 | 23.53 | 3 | 17.65 |
| Roe deer — <i>Capreolus capreolus</i> L. | 5 | 14.71 | 3 | 17.65 |
| Wild swine — <i>Sus scrofa fer.</i> L. | 9 | 26.47 | 3 | 17.65 |
| Brown hare — <i>Lepus europeus</i> Pall. | 3 | 8.82 | 3 | 17.65 |
| Pike — <i>Esox lucius</i> L. | 1 | 2.94 | 1 | 5.88 |
| Fish — <i>Piscis</i> sp. ind. | 1 | 2.94 | 1 | 5.88 |
| Wild animals | 34 | 100.00 | 17 | 100.01 |
| Total | 1614 | | 134 | |

burg,²¹ Xanten²² and Rottweil²³ (Germany) the frequencies of cattle, caprovines and pigs were similar to those of the two latter Hungarian sites. In France the caprovines occupied the first place in Marseille-Bourse,²⁴ the second in Fontaines-Salées and Foissy-sous-Vézelay²⁵ and the third in Montmaurin²⁶ among the domestic species.

Similarly to TÁC-Gorsium the ratio of horses was high both among the specimens and the individuals in Scarbantia too but the asses were completely missing in the latter site. This can certainly be ascribed to the comparatively smaller sample since even among the nearly 48,000 animal remains of TÁC-Gorsium occurred only as few as 34 ass bones. The rarity of domestic cats is not surprising either (this is so in every Roman site); at the same time the dog is only rare among the number of specimens in comparison to the huge amount of dog bones of TÁC-Gorsium (in this latter site there was also excavated a large well yielding a whole series of dog skeletons mainly along with complete skulls),²⁷ the frequency of dog individuals is higher in Sopron-Scarbantia than in TÁC-Gorsium. The frequency of domestic fowl is undoubtedly lower here than in TÁC-Gorsium and the pigeon is totally missing (nevertheless it was only represented by three bones of two individuals in TÁC-Gorsium).²⁸

²¹ J. BOESSNECK: Zur Entwicklung vor- und frühgeschichtlicher Haus- und Wildtiere Bayerns im Rahmen der gleichzeitigen Tierwelt Mitteleuropas. Stud. an vor- u. frühgesch. Tierrest. Bayerns, II, München 1958, 21.

²² K. WALDMANN: Die Knochenfunde aus der Colonia Ulpia Traiana, einer römischen Stadt bei Xanten am Niederrhein. Diss. München 1966, 5.

²³ KOKABI (1982) 16.

²⁴ JOURDAN (1976) 292.

²⁵ TH. POULAIN-JOSIEN: Etude de la faune provenant d'un habitat gallo-romain du IV^e siècle, situé aux Fontaines-Salées à Foissy-sous-Vézelay (Yonne). Bull. de la Soc. d. Sci. Hist. et Nat. de l'Yonne, 102 (1967) 205.

²⁶ TH. POULAIN-JOSIEN: Etude de la faune. In: G. FOUET: La villa gallo-romaine de Mountmarin (Haute-Garonne). XX Suppl. à Gallia. Paris 1969, 317.

²⁷ BÖKÖNYI (1984) 15.

²⁸ BÖKÖNYI (1984) 15.

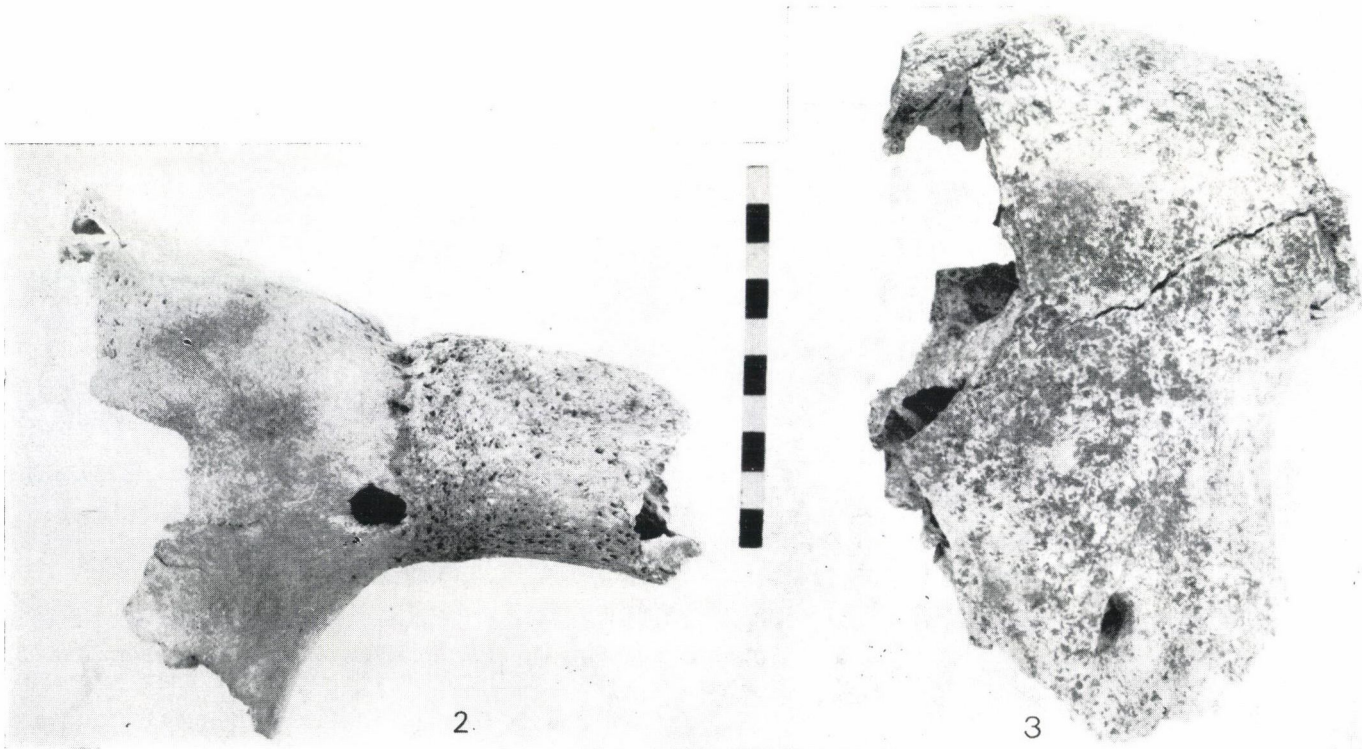


Fig. 1. Brain-skull of domestic cattle of *primigenius* type
 Fig. 2. Brain-skull fragment (horn-core cut off) of domestic cattle of *primigenius* type
 Fig. 3. Brain-skull fragment of domestic cattle of *primigenius* type

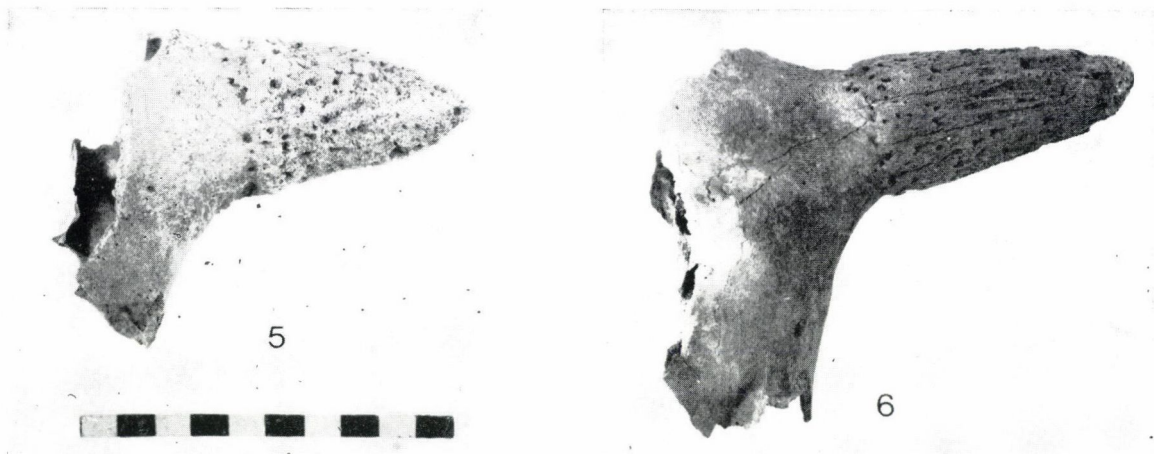


Fig. 4. Horn-core fragments of domestic cattle (1—2. *primigenius* type; 3. *brachyceros* type
 Fig. 5. Brain-skull fragment of domestic cattle of *brachyceros* type
 Fig. 6. Brain-skull fragment of domestic cattle of *brachyceros* type

In the wild fauna of the site occurred exclusively species which were hunted for their meat. Fishes were also eaten. As already mentioned before besides the four most commonly hunted species — aurochs, red deer, roe deer, wild swine — of prehistoric and early historic sites there only occurred the brown hare, a species, whose hunting reached an upswing²⁹ first in the Roman Imperial Period in connection with the introduction and large-scale use of greyhounds. The ratios of the five wild mammal species are identical in terms of individuals.

The wild animals are far behind the domestic ones concerning both the number of specimens and those of the individuals. The domestic: wild ratio is 97.89: 2.11% (number of specimens) and 87.31: 12.69% (number of individuals) respectively. This ratio is certainly better than in the prehistoric period, even in its final phase, nevertheless, it is a little less favourable — particularly as regards the number of individuals — in comparison to other provincial Roman sites where the ratio of domestic animals is essentially higher.³⁰ In fact the situation of Scarbantia reminds one to the bone samples of watch-towers on the limes and smaller military stations³¹ but since Scarbantia was a town lying far from the frontier, this domestic: wild ratio can easily be signalling the beginning of the development toward the disintegration of the well-organized Roman economic order in the province.

THE DOMESTIC SPECIES

The *cattle* remains found in the Forum of Scarbantia (from 1 mature, 26 adult, 6 subadult, 3 juvenile and 1 neonate individuals) represent a quite variable population, and this is valid both for their skull form and size variation.

Concerning the skull form along with horn form, there can be distinguished three groups among them. To the first group belong those skulls which have a flat forehead, a more or less straight intercornual ridge and long horn-cores (*Figs 1–3* and *Fig. 4.1–2*). This is the so called *primigenius* type. The other group has a narrow, wavy intercornual ridge and short, small horn-cores (*Figs 5–6*). This is the so called *brachyceros* type, probably the original cattle of the aboriginal population or — what is even more conceivable — a primitive cattle type arriving from the Barbaricum. The third group is nothing but a transitional form between the above two: its intercornual ridge is wavy, its horn-cores are medium long.

The first group is in all probability the *primigenius* type cattle which is well-known from the Roman provinces but obviously has an Italian origin. Their main characteristics are their typical horn-cores: they are open, they start laterally at their basis and then turn horizontally forwards. In bulls their form is simpler and less curved, in cows they are smaller and flatter and in oxen they have a more complicated form and are often twisted, their walls are thin almost like paper. *Figs 1* and *3* obviously show cows, *Fig. 2* shows a bull and *Fig. 4.1–2* are oxen.

Unfortunately the skulls and horn-cores of the second group are rather fragmented, it is clear, however, that the two horn-cores of *Figs 5* and *6* are from bulls. Probably a cow of this group is represented on a tombstone in Scarbantia (*Fig. 7*). The individuals of the third group are obviously crossings between the two above groups.

²⁹ BÖKÖNYI (1984) 98.

³⁰ BÖKÖNYI (1974) 392.

³¹ M. SCHLOSSER: Über Säugetier- und Vogelreste aus den Ausgrabungen in Kempten stammend. Correspondenzbl. d. deutsch. Ges. f. Anthrop., Ethn. u. Urgesch., XIX (1888) 17 ff; O. SICKENBERG: Vor- und frühgeschichtliche Tierreste und ihre Bedeutung. Rhein. Vorz. in Wort u. Bild, I (1938) 150 ff; A. NEUMANN: Ausgrabungen und Funde im Wiener

Stadtgebiet 1948/49. VHMW 17 (1951) 17; J. BOESSNECK: Die Tierknochen. In: W. KRÄMER: Cambodunumforschungen, 1953—I. MhBV 9 (1957) 103; F. E. WÜRGLER: Die Knochenfunde aus dem spät-römischen Kastell Schaan. Jahrb. d. Hist. Ver. f. d. Fürstent. Liechtenstein 58 (1959) 278; F. DANNHEIMER: Die Rinderknochen der römischen Zivilsiedlung in Hüfingen (Ldkrs. Donaueschingen). FBBW 6 (1964) 13; etc.



Fig. 7. Cattle representation on Roman tombstone from Scarbantia

As regards the frequencies of the three above groups the first is represented by 9, the second by 6, and the third by 3 skull and horn-core fragments respectively.

The large variability can be observed in the size variation too. The withers height determined by Matolcsi's method³¹ on the basis of the length of the metapodials varies between 105.0 and 144.4 cm (*Table 4*). Perhaps it is due to the comparative smallness of the sample that the first two above groups may clearly be distinguished on the basis of the withers height: the larger cattle with a withers height of 126.6 to 144.4 cm and the smaller ones being 105.6 to 122.8 cm high in the withers. The first one can be identified with the first skull type and the second one with the second skull type. The size of some individuals of the first group reaches that of the wild aurochs too as it is shown by two lower M_3 with 41 mm length that already fall into the lower part of variation range of the wild cattle. If in these cases, however, one faces local domestication or successful breeding one cannot decide having a comparatively small sample.

As for the clear size difference between the two above groups one thing is sure: it is not the result of sexual dimorphism because using Nobis' indexes³³ cows, bulls and oxen can be deter-

³² J. MATOLCSI: Historische Erforschung der Körpergrösse des Rindes auf Grund von ungarischem Knochenmaterial. *Zeitschr. f. Tierzüchtg. u. Züchtgsbiol.*, 87, 2 (1970) 113.

³³ G. NOBIS: Ur- und frühgeschichtliche Rinder Nord- und Mitteldeutschlands. *Zeitschr. f. Tierzüchtg. u. Züchtgsbiol.* 63 (1954) 179 f.

Table 4

The determination of withers height and sex of cattle from metapodials

| Greatest length | Proximal width | Smallest width | Withers height (cm) | Nobis' index | Sex |
|-----------------|----------------|----------------|---------------------|--------------|-----|
| Metacarpus | | | | | |
| 171 | 47 | 23 | 105.7 | 27.5 | ♀ |
| 178.5 | 52 | 29.5 | 110.3 | 20.1 | ♀ |
| 183 | 50.5 | 26 | 113.1 | 27.6 | ♀ |
| 184 | 56 | 32 | 113.7 | 30.4 | ♂ |
| 186.5 | 47.5 | 26.5 | 115.3 | 25.5 | ♀ |
| 187 | 51 | 31 | 115.6 | 27.3 | ♀ |
| 189 | 50 | 30 | 116.8 | 26.5 | ♀ |
| 193 | 58 | 32 | 119.3 | 30.1 | ♂ |
| 194.5 | 54.5 | 30.5 | 120.2 | 28.0 | ♀ |
| 206 | 61 | 33.5 | 127.3 | 29.6 | ♂ |
| 207 | 69 | 38 | 127.9 | 33.3 | ♂ |
| 212 | 61 | 36 | 131.0 | 28.8 | ♀ |
| 212 | 64 | 36.5 | 131.0 | 30.2 | ♂ |
| 218.5 | 69 | 41 | 135.0 | 31.6 | ♂ |
| 220 | 66 | 37 | 136.0 | 30.0 | ♂ |
| Metatarsus | | | | | |
| 192 | 37 | — | 105.0 | 19.3 | ♀ |
| 192 | — | 22 | 105.0 | — | ♀ ? |
| 216 | — | 26.5 | 118.2 | — | ♂ ? |
| 224 | 52 | 29 | 122.5 | 23.2 | ♂ |
| 224.5 | 53 | 32.5 | 122.8 | 23.6 | ♂ |
| 231 | 50 | 28 | 126.4 | 21.6 | ♀ |
| 232 | 48 | 27 | 126.9 | 20.7 | ♀ |
| 257.5 | 56.5 | 32 | 140.9 | 21.9 | ♀ |
| 263.5 | 54 | 30 | 144.1 | 20.5 | ♀ |
| 264 | 55 | 29 | 144.4 | 20.8 | ♀ |

mined in both size groups. (Nevertheless, the crossings of the two types or breeds can be determined among the measurable extremity bone fragments.)

It is interesting to compare the frequencies of the above two size groups: their ratio is 14: 11 for the small cattle. In TÁC-GORSIUM the situation was quite different. There besides 73 small local cattle (22.12%) occurred 206 (62.45%) large cattle probably of Italian origin and 51 (15.45%) cattle of unidentified (possibly crossings) type.³⁴ At any rate this comparison shows the decrease of the improved cattle population and the increase of the local stock, however, since the latter could hardly survive unchanged through four to five centuries, these small cattle probably had their origins somewhere in the Barbaricum.

The sexual ratios of both groups are nearly identical: in each group there were three bulls and two oxen, the number of cows was in the large type 6 and in the small one 9.

Among the rare aurochs bones there was only one measurable specimen: a metatarsus with 278 mm greatest length and 70 mm distal width. Using Matoesi's method, it comes from an individual of 152.1 cm withers height, thus probably from a cow.

As regards the caprovines of the site, sheep were represented by more bones than goat, their ratio was 29 : 14 (the other bones could not be identified more closely because of their fragmented state), nevertheless, the ratio of individuals was 8 : 6 for goats (about nine further in-

³⁴ BÖKÖNYI (1984) 28.

dividuals it could not be determined whether they were sheep or goats). This ratio is certainly rare in provincial Roman sites and its explanation can be that while the mainly hornless sheep skulls were chewed up by the dogs of the settlement to such a bad state that they could mostly not be identified, the goat horns did not offer any food to the dogs, and the horn-cores having rather compact walls easily survived in the soil.

Among the *sheep* bones two horn-core fragments were found. One is large, the other is medium large and both are helically twisted outwards, their basis has a triangular cross-section, thus they belong to the so called *copper sheep* type (*Fig. 8*). In fact, they are from rams, the ewes were mainly hornless as evidenced in other provincial Roman sites, though the excavations in Scarbantia did not yield any such skulls.

The only complete sheep long bone is a metacarpus with a greatest length of 138 mm. Using Zalkin's indexes,³⁵ it points to an individual of 67.1 cm withers height. This lies a little below the average (69.58 cm) of the sheep of TÁC-Gorsium,³⁶ however, it is nearly identical to that of the Roman sheep of Central Europe. The other measurable sheep bones point to individuals of similar size, only one or two measurable fragments may come from somewhat larger individuals.

Among the goat bones there are several ones which can be used for type determination. The best specimen is a frontal fragment with both nearly complete horn-cores (*Fig. 9*), and besides it occurred a complete horn-core and nine horn-core fragments. Out of the horn-cores and fragments there is only one (*Fig. 10; 3*) which belongs to the untwisted, scimitar-horned "*eagagrus*" type, all others show homonym twisting, thus representing the so called *prisca* type. Among them there are two really large specimens (*Fig. 10; 1-2*), they obviously come from bucks, all others are of medium size, in all probability from females.

In fact, there are two goats presented on a Roman tombstone found in Scarbantia. One goat is grazing, the other is standing on its hind feet and feeding on the leaves of a tree. The representation clearly points out the damages caused by the goats in forests.

From the 120 mm greatest length of the only whole goat long bone one can determine with Schramm's method that it comes from an individual 69 cm high in its withers. This is a little below the 71.03 average withers height of the TÁC-Gorsium goats.³⁸

The 256 *pig* bones (from 2 mature, 22 adult, 7 subadult and 3 juvenile individuals) point to a rather variable population. Small individuals make up the majority but a couple of larger ones also occur among them. Such big ones, however, which could be considered transitional individuals between domestic and wild pigs cannot be found. Local pig domestication is therefore not probable and is in fact hardly conceivable on the highly developed level of Roman animal husbandry.

It is conspicuous that adult pigs were in an overwhelming majority both among the specimens and individuals that supposes that the meat of most of the juvenile was not consumed in the settlement but was exported. And since the ratio of the skull fragments and feet bones is not particularly higher than that of the bones of body parts carrying prime meat, it is highly possible that the pigs were sold alive (and driven away on foot, what is understandable because they were young and consequently unfattened animals) or cut into two halves (and salted or smoked). This procedure can be observed in TÁC-Gorsium, too.^{38a}

It is similarly conspicuous that the ratio of boars and sows is nearly 1 : 1, and even the ratios of the different age groups are similar in both sexes (*Table 5*). In TÁC-Gorsium the pro-

³⁵ V. I. ZALKIN: Ismenčivostj metapodij u ovetz — The variability of metapodials in sheep. Bull. Mosk. Obšč. Ispit. Prirod. Otd. Biol. 66 (1961) 115 ff.

³⁶ BÖKÖNYI (1984) 41.

³⁷ L. SCHRAMM: kosei długie a wysokose w klebie u kozy — Long bones and height in withers of goat. Roczn. Wyzsz. Szkol. Roln. w Poznań, 36 (1967) 103.

³⁸ BÖKÖNYI (1984) 47.

^{38a} BÖKÖNYI (1984) 103.



Fig. 8. Horn-core fragments of "copper" sheep
 Fig. 9. Brain-skull fragment with both horn-cores of a goat
 Fig. 10. Horn-core fragments of goats



Fig. 11. Representations of goats, one of them feeding on the branch of a tree, on a Roman tombstone of Scarbantia

portion was 3.25 sows to a boar³⁹ and other sites of the Roman provinces (except some with small bone samples) also showed similar ratios.

Among the *wild swine* bones (from an adult, a subadult and a juvenile individual) there were two measurable specimens: the proximal half of a radius and the distal part of a tibia. Both point to a medium size individual.

In the *horse* bone sample of the Forum of Sopron-Scarbantia that came from 9 (1 mature, 4 adult, 2 subadult, 1 juvenile and 1 neonate) individuals only four complete long bones occurred

Table 5
Frequency of age groups among boars and sows

| | ♀ | ♂ | Total |
|--------------|----|----|-------|
| Subadult | 3 | 3 | 6 |
| Adult | 11 | 8 | 19 |
| Unidentified | — | 4 | 4 |
| Total | 14 | 15 | 29 |

³⁹ BÖKÖNYI (1984) 54.



Fig. 12. Representation of a large Roman horse on a tombstone from Scarbantia

(see *Table 1*) that could give direct data concerning the size (withers height) and constitution ("Wuchsform") of the Roman horses of Scarbantia. In fact all four long bones came from adult or even mature animals that already reached their full size and body proportions.

The four bones give the following heights in withers using Vitt's method:⁴⁰ 136 cm (metatarsus), 138.5 cm (metacarpus), 142 cm (tibia) and 142.5 cm (metacarpus). These individuals cannot be considered typical examples of Roman horses because they hardly reach the lower limit of their size variation; they can be better put into the group of the Migration Period horses. At the same time they are undoubtedly larger than the Celtic or Germanic western horses.

As for the constitution ("Wuchsform") of these horses, the smaller metacarpus falls with its 13.3 slenderness index into Brauner's⁴¹ very slender legged, the other metacarpus whose slenderness index is 15.5 into the slightly slender legged group. (In fact, nearly half of the TÁC-Gorsium⁴² horses fell into the latter group but they were essentially larger). The tibia and the metatarsus

⁴⁰ V. O. VITT: Lošadi pasiriksikh kurganov. — Die Pferde der Kurgane von Pasirik. SA 16 (1952) Taf. 1.

⁴¹ A. BRAUNER: Materiali posnaniu domašnih životnih Rossii, 1. Lošad kurgannih pogrebenii

Tiraspolskogo uesda, Hersonskoi gubernii, Equus goschkewitschi mihi. Zapisk. Imper. Obšč. Selsk. Chosi. Južn. Ross., 86, i, Odessa 1916, 1—252.

⁴² BÖKÖNYI (1984) 63.

also point to slender legged thus light horses. In all probability a fore and two hind hoof bones also point to such horses with their narrow, well-arched shape.

At the same time, a right maxilla and mandible fragment ($P_2 - P_4$ is 96 mm), a lower premolar and several extremity bone fragments suggest that larger horses also occurred in Scarbantia. They are identical with that Roman horse breed whose emergence was the result of a conscious breeding and which was first described by Hilzheimer as "Roman military horse".⁴³ Nevertheless, Hilzheimer's horses and these large horses of Scarbantia as well were in size certainly behind the really large horses bred in TÁC-GORSIUM.⁴⁴

An excellent representation of this large Roman horse can be seen on a Roman tombstone found in Scarbantia (*Fig. 12*).

The *cat* is represented by the left half of a mandible (juvenile) and a metatarsal bone (adult). This is all what can be said about them.

Among the *dog* bones of Scarbantia (from 4 adult, 1 subadult and 1 juvenile individual) there were a brain skull (*Fig. 13*), a brain skull fragment, a lumbar vertebra, five ribs, a whole humerus and femur of each and several extremity bone fragments.

Both the whole brain skull and the brain skull fragment belong to the 3rd group of TÁC-GORSIUM whose characteristics are that the skull is of medium size, its crista mediana and lineae semicirculares are well-developed and its frontal region is rather flat.⁴⁵ A great part of the extremity bones also belong to this type, except a proximal ulna fragment which points to a really large animal.

Using Koudelka's method⁴⁶ the 165 mm long humerus comes from a dog of 55.6 cm withers height (small German shepherd or medium Dalmatiner size), the ca. 159 mm long femur (however, it could easily be a little longer, too, because the proximal end was deformed as a consequence of a chronic arthritis) points to an individual 47.9 cm high in the withers (Mittelschnauzer size).

Out of the *hen* bones (from two adult, 1 juvenile and two individuals of undefinable age) two specimens, an ulna and a tarsometatarsus (♀) can be measured. Both are from a small to medium size individual. The unmeasurable fragments also belong to the same category representing the aboriginal unimproved breed. One ulna fragment points to a medium to large hen alone, possibly to the Italian breed. On one of the tombstones found in Scarbantia there are vivid representations of two roosters facing each other (*Fig. 14*).

As regards the *goose* bones of the site, they belong to two comparatively large adult individuals. Domestic geese had occurred in Rome long before, e.g. the story of the geese of the Capitol is well-known, Varro and Columella described the goose keeping of the Roman *latifundia*, and Pliny mentioned domestic geese from Gallia Belgica and Germany.⁴⁷ Osteological remains have been described from several provincial sites of the Roman Imperial Period, the most convincing are those from Magdalensberg (Carinthia)⁴⁸ and TÁC-GORSIUM (Pannonia);⁴⁹ the domesticated state of the former ones can be proved by well-determined anatomical differences, and those of the latter ones by their large size variation and the occurrence of individuals larger than the wild form.

Out of the eight *red deer* remains five are antler fragments (three of them showing sawing marks), and besides them each a mandible, femur and metacarpus fragment can be found. The eight remains represent six individuals. One antler fragment is large thus obviously pointing to a strong bull, the remaining seven specimens do not allow any judgement about size.

⁴³ M. HILZHEIMER: Die im Saalburgmuseum aufbewahrten Tierreste aus römischer Zeit. SJ 5 (1924) 151.

⁴⁴ BÖKÖNYI (1984) 63.

⁴⁵ BÖKÖNYI (1984) 75.

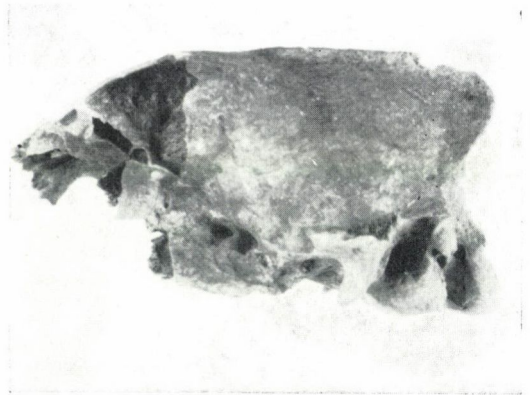
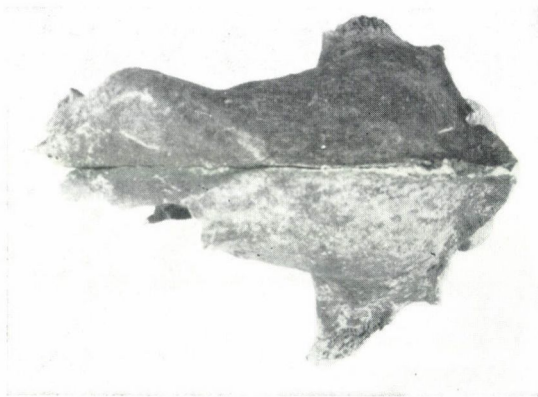
⁴⁶ F. KOUDELKA: Das Verhältnis der Ossa longa zur Skeletthöhe bei den Säugetieren. Verhandl. d. Naturforsch. Ver. Brünn, 24 (1885) 127 ff.

⁴⁷ KELLER (1913) 221.

⁴⁸ N. DRÄGER: Tierknochenfunde aus der Stadt auf dem Magdalensberg bei Klagenfurt in Kärnten, I, Die Vogelknochen. Kärntner Museumschr. 32, Klagenfurt 1964, 26; M. HORNBERGER: Gesamtbeurteilung der Tierknochenfunde aus der Stadt auf dem Magdalensberg in Kärnten (1948—1966). KMS 49, Klagenfurt 1970, 131.

⁴⁹ BÖKÖNYI (1984) 95.

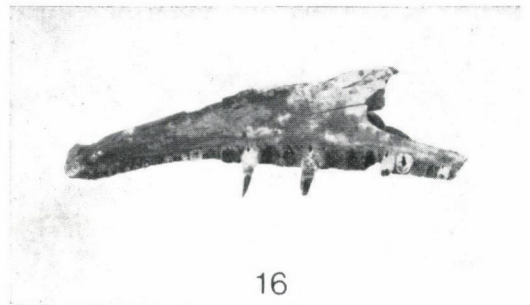
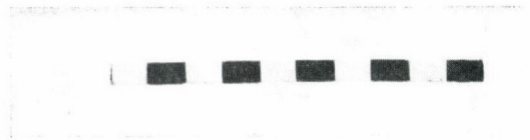
Among the five *roe deer* fragments there are an incomplete antler with carved burr (*Fig. 15*), a left ramus mandibulae fragment, each a left and right distal humerus fragment and the proximal half of a right ulna (the latter comes from a subadult individual, the age of the other specimens cannot be determined). The five fragments represent three individuals, a large one (the



13



15



16

Fig. 13. Brain-skull fragment of a dog. Lateral and dorsal views

Fig. 15. Antler fragment of a roe deer

Fig. 16. Skull fragment of a pike