ARCHAEOZOOLOGICAL INTERPRETATION OF BUTCHERING TRACES OBVIOUS ON SKELETAL REMAINS OF DOMESTIC MAMMALS FROM VORNICENI (BOTOŞANI COUNTY)

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Introduction

The continuously demographical increases of the population and some ritual and / or funeral ceremonies used by prehistorical communities led to exploitation of domestic mammals of medium and big size in the archaeological site of Vorniceni-*Pod Ibăneasa* (Botoşani County). For these mammals, providing the primarily products (meat, lard, bacon, fat) and the necessarily quantity of secondary products (hides, wool, milk, horns) meant butchering of livestock animals by using hidden pits, traps and blunt objects.

The traces of slaughtering domestic mammals were made in order to obtain clothing products and footwear- shoes (by skinning), to get carcasses for barbeques (by disarticulation), or internal organs by evisceration (brain, lungs, heart, kidneys, bone's marrow), big pieces of meat and muscles by fleshing and deboning. For deshidratation or preservation processes, the prehistorical

population used salt or smokehouse. Due to these processes, the faunal remains can by roughly perforated, especially on width bones.

The interpretation of butchering traces obvious on skeletal remains belonging to domestic mammals (which had been discovered to Vorniceni) represents the first archaeozoological mention for Cucuteni A-B phase on the territory of Romania. This study compares the slaughtering traces on domestic mammals skeleton remains found in archaeological site of Adâncata (Suceava County), also belonging to the same cultural aspect.

The domestic mammals involved in this study are: domestic cattle (*Bos taurus*), sheep (*Ovis aries*), goat (*Capra hircus*) and pig (*Sus domesticus*).

Geographical context

The site is located in eastern part of Botoşani - Dorohoi Depression and to the north of Cozancea Hill (at about 3 kilometres east of the homonymous village[1]. The settlement is situated nearby the western edge of the farm Dubina, on the right bank of the river Ibăneasa, on a height of 270 m, having to the north and east slopes more or less steep.

Soils are predominantly grey forest type (rich in quartz and poor in humus) associated with clay hard and clay, that have been sighted in terraces[2], in slopes with more or less steep of Ibănești Hill. In the western of the archaeological site of Vorniceni were identified also patches of zlotys / compact chernozem (rich in humus, having fine texture, low porosity and permeability). The site is crossed on the left side by one of the most significant tributary of Jijia river, Ibăneasa stream. It has 42 km length and also a permanent course, due to underground water supplies of Ibănești Hill. Sulfonate waters are rich in sulphate, sodium, magnesium (in south-east) and bicarbonate (in north and west). The settlement has sedimentary stronger facies, with coastal deposits (sandstones and oolithic limestones) and patches of clay infilled microconglomerates siliceous, which shape a haughty relief[3].

[1] P. Șadurschi *et alii*, *Vorniceni, com. Vorniceni, jud. Botoșani, punct: Pod Ibăneasa*, in *Cronica Cercetărilor Arheologice din Romania. Campania 2003*, XXXVIII, p. 372-374.

[2] Al. Păunescu *et alii*, *Repertoriul arheologic al județului Botoșani*, București, 1976, p. 230-236.

[3] V. Tufescu, *Județul Botoșani*, Editura Academiei, București, 1977, p. 260-270.

Archaeological context

The archaeological excavations to Vorniceni had been coordinated by P. Șadurschi in 2000-2003 and M. Diaconescu in 2004-2010.

The archaeological and archaeozoological materials, recovered throughout of the digging rescue campaigns belonged to the Chalcolithic (Cucuteni A-B phase), Bronze Age (Noua culture), Iron Age (Hallstatt) and also to the migrations period.

In the Cucuteni A-B level faunal remains has been discovered in 13 dwellings (L. 1-3, 5-8, 11-16), 20 ditches (S. 1-57-9, 11-22), 21 pits (Gr. a, b, 5-7, 12, 16, 21, 22, 25, 27-30, 32-35, 37, 40, 42), 3 cassettes (Cas. A-C) and also *passim*.

Characteristically for Bronze Age (Noua culture) level, the faunal remains were found on the base of an oven, which had been fulfilled with ash, (well known as ashtray), due to boiling and grilling meat and internal organs. From the Iron Age (Hallstatt) level skeletal elements of domestic mammals were found on the ground of a hovel.

Materials and methods

Faunal remains discovered in digging rescue campaigns[4] in 2000-2010 had been brought within the Laboratory of Restauration and Preservation of Botoşani County Museum where the skeletal remains had been washed using warm water, liquid soap, soft brushes and anatomical tweezers), then some of them had been undergone to consolidation and anatomical reconstruction processes within the Comparative Anatomical Laboratory from Archaeozoology Institute of Groningen (Holland), under the coordination of T. Jacobs and W. Prummel. The accuracy of anatomical identification was based on description of atlases[5] and books of husbandry[6].

Into the processes of ageing[7], sexing or estimating the height of the withers[8] of the slaughtered osteological remains[9] belonging to domestically

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[4] M. Udrescu *et alii*, *Introducere în arheozoologie*, Editura Corson, Iași, 1999, p. 55-60.

[5] K. Habermehl, *Alterbestimmung bei Haus und Labortieren*, Paul und Parey Verlag, Hamburg - Berlin, 1975.

[6] W. Prummel, *Distinguishing features on the postcranial skeletal of cattle – Bos primigenius f. taurus and red-deer – Cervus elaphus*, in *Schriften aus der Archaeologisch-Zoologischen Arbeitgroupe*, Heft 12, Schleswig - Kiel, 1988.

[7] C. Grigson, *Sex and age determination of some bones and teeth of domestic cattle*, in B. Wilson *et alii* (eds.), *Ageing and sexing animal bones from archaeological sites*, *British Archaeological Reports*, *British Series*, 109, London, 1982, p. 7-25.

[8] A. Von Den Driesch, *A guide to the measurement of animal bones from archaeological site*, in *Bulletin of Peabody Museum of Archaeology and Ethnology*, Harvard University, Harvard, 1976.

mammals, which had been recovered in this site was taken into account the degree of suture of *neurocranium* fragments[10], the stage of eruption[11] and weariness of the teeth[12], the presence of growing cartilage of the postcranial skeleton elements[13], the porosity[14] and metrical data of the horn-cores[15].

Results and discussions

The site had been analysed from archaeozoological point of view in 2000-2006 by S. Haimovici and A. Ungurianu. Then after, the osteological material had been analysed by us. In her paper, A. Ungurianu analysed 3301 mammal osteological remains, out of which 2574 belonged to Cucuteni A-B level and 727 were recovered from Bronze Age layer. The archaeozoological analysis does not take into account the interpretation of the slaughtering traces obvious on the skeletal remains. In 2009-2016 had been interpreted from archaeozoological point of view 4139 faunal remains belonging to Cucuteni A-B phase out of which 4056 mammals remains (97.99%), 3 osteological remains of *Homo sapiens* (0.07%), 15 of birds (0.36%) and 65 of molluscs (1.57%). Characteristically to Bronze Age, inside of the ashtray, were analysed 430 mammal remains (99.30%), one of bird (0.23%) and 2 of molluscs (0.46%). In the Iron Age level were analysed only 12 osteological mammal remains.

Of the total of 4056 mammals remains discovered in Cucuteni A-B level, 3190 belonged to domestic mammals (78.64%) and 866 (21.35%) to the wild one's. In the ashtray, typically for Bronze Age layer, 369 osteological remains belonged to domestic mammals, representing 85.81% (including the horse, which had been domesticated), of the total of 430 faunal remains. In the same ashtray had been identified 61 faunal remains of wild mammals (14.18%). In the Iron Age level only 10 faunal remains belonged to domestic mammals and 2 to wild one's.

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[9] D. Helmer, *Fishes d'ostéologie animale pour l'archéologie. Serie B: Mammifères. No. 1. Fishes descriptives pour les réléves d'ensembles osseux animaux*, Centre de Recherches Archéologiques du CNRS, Paris, 1987.

[10] R. Barone, *Anatomie compare des mammifères domestiques*, tom. I, Edition Vigot Frèves, Paris, 1976, p. 296.

[11] V. Coțofan *et alii*, *Anatomia animalelor domestice*, vol. I, Editura Orizonturi Universitare, Timișoara, 2000, p. 67-198.

[12] E. Pașteа *et alii*, *Anatomia comparativă și topografică a animalelor domestice*, Editura Didactică și Pedagogică, București, 1978, p. 78-465.

[13] C. Spătaru, M. Spătaru, *Manual practic de anatomie veterinară – aparatul locomotor*, Editura Tehnopress, Iași, 2004.

[14] *Ibidem.*

[15] Ph. Armitage, *A system of ageing and sexing the horn-cores of cattle from British post-medieval sites (with special references to improve British long horn cattle*), in B. Wilson *et alii*, *op. cit.*, p. 37-55.

From NISP point of view, in prehistorical palaeoeconomy and also for Chalcolithic period (Cucuteni A-B phase), domestic cattle ranks the first place (1765 osteological remains), representing 57.06%, of a total of 3093 domestic mammals remains. The sheep / goat group was placed secondly with 728 faunal remains (23.53%) and the pig having 600 skeleton remains was ranked the third (19.39%). Within the sheep / goat group, the *Ovis aries* is most important (with 536 bony remains), representing 73.63% and then *Capra hircus* having 192 osteological remains (26.37%). As known, the dog has less palaeoeconomical importance and it is used by prehistorical communities for protection and guidance in hunting races. In the site were identified 97 osteological remains of dog belonging to 20 old individuals (5.33% of the total individuals of domestic mammals). Of the total of 3190 domestic mammals remains, the *Canis familiaris* represents 3.04%. From MNI point of view, in the Cucuteni A-B level the cattle ranks the first place, having 968 individuals (of the total of 1702 with palaeoeconomical importance), representing 56.87%. The sheep / goat group is placed the second (having 424 individuals, which represents 24.91%). Within the sheep / goat group, the *Ovis aries* ranks first place with 75% and only 25% belonged to *Capra hircus*. The pig ranks the third, having 210 young individuals and 12.33% as frequency.

Palaeoeconomically, taking in consideration NISP, in the Bronze Age layer, the domestic cattle represents 65.04%. The sheep / goat group is placed secondly (20.86%), and the pig ranks the third (7.58%). Although the horse is domesticated, it was used and butchered in and by prehistorical community as an old individual. Of the total of 192 individuals belonging to domestic mammals, 128 belonged to domestic cattle (66.66%), 32 of sheep (16.66%), 8 of goat (4.16%), 16 of pig (8.33%), seven of horse (3.64%) and one of dog (0.52%). In the same layer had been identified two individuals of wild mammals (one for each of hare and squirrel) of a total of 194.

Palaeoeconomically, the husbandry represents the most important modality of providing primary and secondary products, needed for nourishing the population in prehistorical community of Bronze Age. The horse is used for traction in the household of Noua culture, and the dog has less palaeoeconomical importance, both of them being sacrificed as old individuals, only for hides.

Palaeoeconomically, from MNI point of view, the domestic cattle ranks first place (having 128 individuals of a total of 184), representing 69.56%. The second place was ranked by sheep / goat group (for which had been estimated 40 individuals, out of which 32 belonged to sheep and eight to goat) having a share of 21.73%. The pig ranks the third place (having 16 young individuals, which represents 8.69%).

In the Iron Age the husbandry (from NISP point of view) represents 83.33% and the hunting only 16.66%. Of a total of ten domestic mammal remains, 8 belonged to *Bos taurus* (80%) and one to *Ovis aries* (10%). The horse (10%) is not used by prehistoric community for hides or meat, but only for races or battles. In the Iron Age had been estimated of a total of 5, 3 individuals of domestic cattle, and one for each of sheep and horse.

Description of slaughtering traces

The butchering traces[16] found on the skeletal remains of domestic mammals to Vorniceni are skinning, evisceration, deboning, disarticulation and fleshing. The obvious split of the bones are described from theoretically point of view.

Skinning a domestic mammal refers to detachment of the hides obvious on the extremities of the head and also on the fore and hind-legs, involving those bony parts of the body covered by a thin layer of fat and then hides. Theoretically, these traces appears as fine lines on *neurocranium* and *viscerocranium* bones (frontal, around horn-cores, nasal, maxilla, horizontal part of the mandible) and on the distal or proximal ends of upper and lower *zeugopodium* (*radius*, *ulna*, *tibia* or *fibula*). Most of the skinning traces could be seen on the surface of phalanx, metapodals and tarsi bones).

Eviscerating a domestic mammal means pulling out the internal organs situated inside of cavities: spinal cord and bone (marrow), skull (brain), thoracic cage (heart, lungs, timus) or abdomen (bladder, liver, kidneys, spleen, guts). The split is very deep and complete. The transversal signs of the cut-mark could be seen on the extremities of the ribs, sternum or hyoid bone. The skull and mandible are mostly eviscerated by using a longitudinal split, located right in the middle or behind the horn-cores.

Deboning and disarticulation of a domestic mammal involves the detachment of the head and also the fore- and hind-legs from the body. The deboning signs appears as fine lines, incomplete and oblique on the occipital bone and on the surface of cervical vertebrae, but also on *scapula*, *pelvis* bone and *sacrum.*

Fleshing consists in preparing the big junks of meat and carcasses belonging to domestic animals by using a deep and short cut-mark of the bone, due to detachment of the ligaments. These traces could be seen longitudinally on the distal and proximal extremities of long bones, also around the articulation cavities of *scapula* and *pelvis* bone. The short and width skeletal remains have transversally traces of fleshing; most of them obvious on ribs, vertebras and tarsi bones.

[16] R. Lauwrier, *Animals in Roman times in the Dutch eastern river area. Appendix: butchery mark code*, in *Project Oosterlijke Rivierengebied-Nederlandse Oudheden*, XII, Amesfoort, 1990, p. 118-212.

Chalcolithic (Cucuteni A-B phase)

In the Cucuteni A-B level could be seen 2924 skeletal elements of domestic mammals, of a total of 3093 (having importance in prehistorical community) and 3190 (which include the dog) with traces of slaughtering.

It were analysed 1765 osteological remains of domestic cattle, 539 of sheep, 192 of goat, 600 of pig and 97 of dog. Out of those, 1688 faunal remains of *Bos taurus* (95.63%), 480 of *Ovis aries* (89.55%), 183 of *Capra hircus* (95.31%), 573 of *Sus domesticus* (95.5%) and 50 of *Canis familiaris* had traces of slaughtering.

Comparing with the Iron Age level, where all the faunal remains belonging to domestic and wild mammals had butchering traces, in the ashtray of Bronze Age layer 195 of domestic cattle (81.25%), 59 of sheep, 15 of goat, 23 of pig and also one of dog and horse had slaughtering signs obvious on faunal remains.

The number and the frequency of the slaughtering traces obvious on the skeletal remains of domestic mammals, which had been discovered in the site of Vorniceni-*Pod Ibăneasa*, from Cucuteni A-B phase (tab. 1) in comparison with Bronze Age (tab. 4) and Iron Age, gives us clues in establishing the most important modality of providing food in Chalcolithic period – husbandry. Providing the daily food needs (meat, internal organs) of prehistoric populations meant constantly scarification of old or unusefull individuals of domestic mammals in the household. The cooking process of the meat, junks and internal organs pulled out and belonging to domestic animals in the prehistorical communities involved not only boiling, but also grilling. Above of the skeletal remains it is possible to appear sings of black burnt, ash and white burning. The waste material of Chalcolithic population can be used by wild mammals (especially carnivorous) as daily food. On the surface of the skeletal remains could be seen the tip of the canines teeth, or incisivorous of rodent and carnivorous mammals.

In the Cucuteni A-B level the evisceration process of *Bos taurus* osteological remains was linked to pulling out the brain, the tongue, or internal organs which were placed inside of thoracic cage or in the abdomen cavity. 109 skull fragments (representing 31.14%) of a total of 350 skeletal remains of domestic cattle had been butchered for obtaining the brain. The cut-marks obvious on the neurocranium fragments (fig. 1) were placed mostly transversally, in the middle of the frontal bone suture (36 of a total of 109), and longitudinally 9 (of a total of 109). The oblique splits had been done on skull fragments from the right (24 of a total of 109) or from the left sides (27, representing 24.77%) in order to get the brain. In the same sample were found the 67 skulls of *Bos taurus* with round perforation located in front, in the middle of the horn-cores.

In this site were discovered 28 horn-cores *brachyceros* type (belonging to female individuals) and *primigenius* type (being assigned to male individuals) which had been split behind the basal circumference of the horns. 8 of those had been cut transversally, 4 had been split from the right side and 2 had been chopped from the right side. The horn-cores had been split in order to get also the brain (well-known that the horn-cores are empty and are related to brain cavity).

It were found 4 fragments of hyoid bone. The prehistoric population used as daily food the tip and the body of the tongue. Two of the cut-marks obvious on the hyoid bone were done longitudinally, one was made transversally and another one was oblique, being applied from the left side.

58 of a total of 350 eviscerated bony remains of domestic cattle (involving 14 vertebras and 48 flotant ribs) represents a prove of pulling out the abdominal internal organs (kidney, liver, spleen, bladder). 25 of a total of 58 had been split transversally, 10 were split from the left side, another 7 from the right side. 16 of a total of 58 skeletal remains were split longitudinally. Obtaining lungs, heart, or thymus as primary food for prehistoric population meant detaching and opening of thoracic cage. In the studied sample were found 41 fragments of ribs-sternal cartilage and other 33 curved parts of the ribs (of the total of 74). Another 78 skeletal remains of domestic cattle were eviscerated for marrow in household. Out of total, 50 osteological fragments of *Bos taurus* were used for spinal marrow and other 28 for bony type. Most of the long bones (*femur*, *tibia*, *humerus*) had been split transversally (21 of a total 28) and other 7 were first detached from epiphysis and then split longitudinally. 27 of a total of 50 vertebras used for marrow had longitudinally cut-mark, other 7 were split transversally. 6 of a total of 50 had cut-marks were applied from the left-side and other 6 from right side. Interesting is the fact that in the Cucuteni A-B level had been found 4 cervical vertebras with perforation on the dorsal vertebral arch.

In the table 2 is presented a comparison between evisceration skeletal remains of the sheep and goat in the Cucuteni A-B level. Also, it had been analysed the location and the orientation of the cut-mark. In the site of Vorniceni, characteristically for female individuals are prisca's horn-cores (fig. 3), in comparison with goat (where for male's was found (for first time in the Chalcolithic sites analysed from archaeozoological point of view) an *aegagrus* horn-core type. For female individuals of goat, the horn-cores were also prisca's type. It had been found 10 horn cores of sheep with traces of evisceration.

In the table 3 was presented the evisceration signs discovered on the skeletal remains of pig Evisceration cut-marks obvious on pig skeletal remains give us information about the usefulness of meat and internal organs in daily food schedule in Cucuteni culture. Most of the pig skulls were transversally split (21 of a total of 60), then followed by cut-marked applied oblique-from left side (16 of the total of 60) and then from the right side (11 of the total of 60).

Fleshing gave to prehistoric population the possibility to obtain parts of hind or fore-legs of the domestic mammals. By fleshing you can get from gastronomically point of view sirloin, short loin, round, breast, flank, fore shank or plate. In the studied sample had been found 180 skeletal remains of pig having fleshing traces. Out of these were 50 horizontal branch of mandible (27.77%), 14 *maxillae* (7.77%), 31 body connected anatomically to scapula spine's (17.22%), 14 *acetabulum* cavities of *pelvis* bone (7.77%), 18 proximal epiphysis attached to two-thirds of *humerus* diaphysis (10%), 11 diaphysis of *femur* (6.11%), 18 fragments of distal *radius* diaphysis (10%), 23 oblique part of anterior face of *tibia* diaphysis (12.77%) and also a rib (0.55%).

In this site had been analysed 56 skeletal remains of goat with fleshing traces. Out of these were 6 vertical branches of mandibles, 6 distal parts of *maxillae*, 10 *scapulae* (represented by spine attached to the body), 5 *acetabulum* cavities of *pelvis* bone, 5 distal epiphysis related anatomically to the last third of *humerus* diaphysis, 2 thirds of diaphysis and distal epiphysis of *femora*, 13 diaphysis of *radius*, 6 of *tibia* and 3 proximal parts of *cubitus*.

It were analysed 121 skeletal remains of sheep with cut-marks of fleshing. Out of these 24 were represented by horizontal part of mandibles (fig. 2), including the diastema and symphysis (19.83%), 3 fragments of *maxillae* (2.47%), 15 distal fragments of *humerus* (12.39%), 18 proximal fragments of *femur* (14.87%), 2 thirds of 15 *radius* proximal diaphysis (12.39%), one third of distal posterior diaphysis of 10 *tibia* (8.26%), 4 *acetabulum* cavities (3.30%) and 32 body attached the spine (26.44%). Mostly prehistoric population in Chalcolithic period had eaten sirloin and chuck, breast, fore shank and plate belonging to the sheep / goat group.

In the Cucuteni A-B level had been found 393 skeletal remains with fleshing cut-marks belonging to domestic cattle. Out of these 110 were represented by horizontal parts of mandibles (27.98%), 30 maxillae attached to incisive bone (7.63%), 64 bodies and spines of *scapula* (16.28%), 25 proximal fragment of *humerus* (6.36%), 74 diaphysis of *femur* (18.82%), 51 acetabulum cavities of pelvis bone (12.97%), 15 diaphysis and distal ends of *radius* (3.81%), 24 oblique fragments of posterior face of tibia (6.10%).

Disarticulation animals implies the detachment of big junks of meat and carcasses. In this site had been analysed 253 skeletal remains of domestic cattle, 66 of sheep, 20 of goat and 55 of pig.

It had been studied out of a total of 55 skeletal remains of pig with disarticulation as follows: 21 proximal fragments of *cutisus*, 8 *ileum* and pubis bone (assigned to *pelvis*), 6 distal fragments of *humerus*, 11 distal parts of diaphysis attached to unfused epiphysis, 3 distal parts of distal epiphysis of *femur* and respectively *radius*, 1 diaphysis of peroneus and 1 fragment of rib. 17

of these skeletal remains disarticulated of pig had had transversely cut-marks and other 30 had been oblique split (fig. 4).

In the archaeological site of Vorniceni had been found 253 skeletal remains disarticulated of domestic cattle. Out of these were 10 bodies of vertebras (3.95%), 17 ribs (6.71%), 6 horizontal parts of mandibles (2.37%), 29 distal fragments of *humerus* (11.46%), 25 proximal epiphysis of *tibia* (9.88%), 15 proximal ends of *radius* and other 15 distal fragments of *femur* (each had 5.92%), 22 proximal epiphysis of *cubitus* (8.69%), 2 *patellas* (0.79%), 36 of *carpi* and *metacarpus* (14.22%), 6 distal fragments of *metatarsus* and *tarsi* (2.37%), 26 proximal epiphysis of distal *phalanx* (10.27%).

In the same sample had been found 19 *acetabulum* cavities of *pelvis* bone and 17 cotiloid cavities of *scapula* belonging to old individuals of domestic cattles. The bony remains had had cut-marks around the proximal epiphysis and also in the middle of the joints, giving us clues about the professional qualities of the Chalcolithic butcher. Mostly of the *Bos taurus* disarticulated bones had transversally cut-marks (85%) and oblique one's (12%) and less were longitudinally split (3%).

In the studied sample, had been discovered 66 skeletal remains of sheep having disarticulation cut-marks. Out of these had been analysed 7 distal fragments of *humerus*, 20 fragments of *tibia* (15 distal and 5 proximal), 1 proximal fragment of *metacarpus*, 3 distal diaphysis of *metatarsi*, 7 proximal epiphysis of *cubitus*, 11 proximal fragments of *femuri* (including the caput), 5 distal fragments of *radius*, 1 rib, 1 body of lumbar vertebrae, as well as 6 cotiloid cavities of *scapula* and other 4 *acetabulum* cavities of *pelvis* bone. Excepting one fragment of the *radius* which had been longitudinally cut, all other bones belonging to sheep had been transversally split.

In the Cucuteni A-B level had been found 20 skeletal remains of goat with disarticulation traces. Out of these 2 were distal fragments of *radius*, 4 of proximal end of *cubitus*, 2 proximal fragments of *femuri* and other 2 of *tibia*. In the same studied sample had been discovered 4 distal fragments of *metatarsus* and 3 of *metacarpus* as well as 3 proximal cavities of *scapula*. All the skeletal remains disarticulated of goat had been transversally split in order to get short loin, sirloin, round and chuck.

Deboning implies the removal of the usefulness parts of the body that have less meat and internal organs. By deboning, the hooves, the head of domesticated mammals can be easily detached. In the Cucuteni A-B level were found 32 skeletal elements of pig, 18 of goat, 60 of sheep and 347 of domestic cattle having deboning traces.

It had been found 1 proximal end of *metacarpus*, 4 fragments of *viscerocranium*, 11 distal parts of *metatarsi*, 1 of the *peroneus*, 9 *tarsi* of pig which had been transversally cut-marks on their plantar faces, 4 skeletal

elements of pig with deboning traces and oblique cut-marks, 4 mandibles with transversally cut-marks on the coronoid apophysis and oblique cut-mark in the middle of gonion of lower jaw, 2 distal *phalanx* of pig had their tip broken as a result of deboning.

In this site had been identified 347 skeletal remains of domestic cattle with deboning cut-marks. Out of these 72 were represented by distal and two-thirds of *metacarpi* diaphysis (20.74%), 97 were proximal ends of metatarsi (27.95%), 20 bodies of vertebras (mostly lumbar and less cervical, representing 5.76%), 34 were *tarsi* and *carpi* (9.79%), 63 were ribs (18.15%) and 61 *phalanx* (17.57%). Of the total of 347 deboned skeletal elements of domestic cattle, 21 had longitudinally cut-marks (6.05%), and 326 (representing 93.94%) had had transversally and oblique cut-marks.

It had been analysed 60 skeletal remains of sheep having deboning traces. Of the total of 60, only 21 were represented by distal epiphysis of *metacarpus*, 29 were proximal epiphysis attached to the first third of *metatarsi* diaphysis, 6 were ribs and other 4 were proximal and anterior face of 2 *phalanx* and *tarsi*.

In the Cucuteni A-B level had been analysed 15 distal fragments of *metatarsus*, 1 body from lumbar vertebrae and other 2 proximal ends of *metacarpus*. All (18) the skeletal bones had been oblique split and belonged to the same specie – goat.

We can conclude that all the skeletal remains belonging to domestic mammals, in the Chalcolithic period, with importance in the palaeoeconomy of prehistorical communities could be considerate as waste food material. From the domestic animal, prehistoric population, especially in Chalcolithic period used meat, fat, lard and internal organs as supplies, as well as secondary products (hides, milk, wool, hair).

Bronze Age (Noua culture)

In the ashtray of Bronze Age (Noua culture) were identified signs of usefulness of the waste food-material by carnivorous and rodent mammals. Also very few osteological remains belonging to domestic mammals gave us clues of cooking and preparation, having black, white spots or ash above. Rodent gnawed and ashtray sings could not be seen on the skeletal remains of sheep, in comparison with absence of black burnt and carnivorous gnawed traces on the bony remains of goat. On the surface of two skeletal remains of pig had been seen one sign of ash and also a gnawing by carnivorous mammals.

In the ashtray, characteristically for Bronze Age layer had been discovered 24 signs of evisceration, out of which 5 were observed on skull, 16 on thorachal cage (including the *sternum* and rib-sternal cartilage) and 3 on vertebras. The cut-mark had been done in order to cook and get the brain (by grilling), the heart, lungs and the spinal marrow (by boiling). 19 cut-marks (3 on

skull and other 16 on ribs) had been done complete and transversally. The lumbar vertebrae had been completely longitudinally split, on the dorsal face and also in front of transvers apophysis. One skull had been perforated with an axle exactly in the middle of frontal suture and another skull had an oblique cut-mark above the orbital bone.

In comparison with evisceration signs obvious on skeletal remains of domestic cattle, in the same sample and layer, for sheep and goat had been analysed 19 and respectively 3 traces of pulling out internal organs. The sheep has a hyoid with cut mark transversally done, 2 skulls (1 perforated and 1 completely and perpendicular split), 12 ribs (out of which 9 had oblique cut-marks and 3 were split along the longitudinal axe). For 3 of four vertebrae's, the bony body had been split to obtain the spinal marrow by using longitudinally cut-marks and for the last had a transversally one. Concerning goat had been identified three ribs with short, oblique and deep cut-marks of evisceration.

The evisceration of pig had been observed on four skulls and three ribs. 3 of a total of 4 skulls of pig had transversally cut-marks, in comparison with the last which had a split parallel with frontal sute, also placed on the right side. The posterior ribs had been split complete and oblique.

Fleshing traces observed in the ashtray, typically for Bronze Age appeared on 52 skeletal elements of domestic cattle, 15 of sheep, 2 of goat and 4 of pig. Out of a total of 52 fleshed bony remains of *Bos taurus*, 13 had been seen on *scapula*, 9 on *femur* diaphysis, 14 on *tibia*, 8 on bony fragments of *humerus* and another 8 on *radius*. The *scapula* presented 9 cut-marks along the *spina*, also 3 split oblique behind the proximal end. These splits were done from the ventral edge of cotiloid cavity till the first third of *scapula* length, just in front of *spina*. 14 proximal fragments of *tibia* of domestic cattle had been fleshed by using a transversal cut-mark on the anterior face, just behind the *spina*. Another 9 distal ends of *femur* (which are connected anatomically with diaphysis) were fleshed. 7 of these presented straight split and 2 had been asymmetrically chopped, from the lateral till the medial face. *Radius* and *humeri* of domestic cattle had been split behind the proximal end and in front of distal end. The diaphysis of *humeri* had transversally cut-marks at each side, in comparison with *radius* diaphysis which had asymmetrically splits (from the middle of medial face till the proximal or distal end of the lateral face).

The fleshing traces observed on the surface of osteological remains of sheep appeared mostly on bones with a big quantity of meat or marrow. Out of total of 15, 5 were *radius*, 2 *tibia*, 3 *scapula*, 1 *humerus* and 4 *femuri*. Belonging to goat had been analysed 2 fleshed bones (1 mandible and a diaphysis of a *femur*). All the sheep shoulder bones had been split along the *spina*. Also on the sternal part of these were seen fine scratches. 4 *femuri* of sheep and 1 of the goat had been fleshed by using transversally split nearby the

middle of diaphysis. The fleshing cut-marks obvious on the 2 *tibia* and 1 *humerus* had been asymmetrically made (from the proximal end of the lateral face till the middle of diaphysis on the medial face). Having traces of fleshing, in the ashtray discovered in the Bronze Age had been analysed 5 diaphysis of *radius* belonging to sheep. The skeletal fragments has been split complete and transversally at each side (just in front of the distal end and behind the proximal epiphysis of the bones).

Belonging to pig, in the ashtray of this site, had been recovered 4 skeletal remains with fleshing traces (2 diaphysis of *tibia* and also 2 upper jaws). On the external faces of the upper jaws appeared fine and asymmetrically scratches, placed along due to detachment of the meat and the ligaments.

In the ashtray discovered in the Bronze Age had been observed intentionally perforation, placed on the distal part of *scapula* or on the first or last third of the long bone diaphysis (having rectangular, square or circle shape), due to deshidratation of the meat and it conservation (by adding salt) in winter times. Belonging to old domestic cattle were analysed 2 proximal ends of *radius*, 3 *scapulae* and 1 *tibia* having signs of conservation. If the round shape of perforation on the anterior face of the *tibia* and of 2 *radius* had been place on the proximal ends, for those 3 *scapulae*, the split had been done as rectangular shape, being located on the distal part of the bone. The same skeletal element (*radius*) belonging to goat and pig had perforations intentionally done. The location of those were quite different. In goat case, the depression had been seen on the posterior face, just in the middle of the diaphysis, in comparison to the perforation observed on the lateral face of *radius*, having a square shape and being placed in the first third of proximal end of a long bone, which had been assigned to the pig.

Skinning in prehistoric communities was due to removal of hides from the butchered domestic mammals. Belonging to domestic cattle in the ashtray of Bronze Age had been analysed fine scratches obvious on the 3 *calcanei* and 2 distal *phalanx*. If the scratches had been seen on the lateral and plantar faces of the *tarsi*, in acropodial case the skinning traces were observed around of the superior length of the *phalanx*. The traces left over after the removal of domestic mammals hides could be seen on the distal end of the *tibia* of a goat, on the plantar face of an *astragalus* of sheep and on the anterior faces of 2 *metatarsi* of pig.

By deboning, prehistoric communities could get big parts of an animal (fore or hind leg, head or tail). It had been recovered 29 *metapodi* of domestic cattle (out of which 20 were *metatarsi* and 9 *metacarpi*). 13 of these had been split transversally and 16 osteological remains presented asymmetrically cut-marks (executed for 7 of them from the lateral face of the proximal end till the

middle of diaphysis and for others nine from the middle of the medial faces of the diaphysis till the distal end of the lateral faces of metapodi).

For sheep had been analysed 12 metapodi (out of which 7 were *metacarpi* and 5 *metatarsi*). For goat had been recovered 3 *metatarsi* with deboning traces. 13 of a total of 15 had been split transversally, most of the time on the anterior face and nearby the proximal end or distal end of the *metapodi*. This fact could be related to removal of hooves and some bony parts which had less meat or marrow. Another three metapodi (out of which two were metacarpi and one metatarsus) were detached by using the asymmetrically.

The deboning process on pig could be seen on the proximal ends of 3 ribs (nearby the thorachal vertebras).These splits could be explained by detachment of the upper legs from the body. The cut-marks was done completely and transversally (for all the skeletal elements).

Disarticulation process appeared on 34 skeletal remains of domestic cattle, 7 of sheep, 2 of goat and 8 of pig, of a total of 51 traces. For *Bos taurus*, in the ashtray of the Bronze Age layer were identified disarticulation traces on 12 mandibles, 20 vertebras, 2 *cubiti* and 10 of *pelvis* bones. 2 distal epiphysis of *ulnae* also attached to the last third of the diaphysis presented incomplete and transversally cut-marks, located only on the posterior faces of the bones. Another 10 pelvic bones had traces of detachment of the hind legs. 8 of these had transversally cut-marks which had been seen on the surface of the dorsal face of the *ileum* and another 2 on the lateral face of *ischion* bone, but executed parallel with pubis suture (one being located on the right side and another on the left side). 12 mandibles of domestic cattle had had traces of disarticulation. Of the total, 9 mandibles had been split transversally before the coronoid apophysis and gonion. Another 3 mandibles had been split also perpendicularly, behind the diastasis and canine tooth. Of a total of 20 vertebras of *Bos taurus* with disarticulation traces, 12 were placed on lumbar and sacral vertebras (having cut-marks before spinal, transversally apophysis as well as zygapophysis, mostly on the dorsal face). Another 8 had on the dorsal arches of the cervical vertebras finest cut-marks orientated transversally. Another 6 proximal ends of ribs as well as 1 occipital bone of an old individual of sheep had been asymmetrically cut-marks in order to remove the head and the thorachal cage, fulfilled with internal organs (heart, lungs, thymus, tong, brain). Another 2 *metatarsi* of goat had been disarticulated transversally and incomplete on the distal third of the diaphysis. The split had been done for removal of ligaments.

In this site had been analysed 8 bones disarticulated of pig (out of which 2 proximal end of *femuri*, 3 distal ends of *radius* and also 3 lower jaws). All of them had transversally traces.

Iron Age (Hallstatt)

In the Iron Age (Hallstatt) layer were analysed 8 skeletal remains of domestic cattle, all of them having traces of slaughtering: 3 eviscerated, 2 deboned and 1 for each skinned, disarticulated and fleshed. The evisceration traces involved only the skull, 2 of them presenting a complete and powerfully split on the left side of the frontal bone, above the orbital.

In the same sample, 1 proximal end of a *tibia* had been disarticulated, 2 distal ends of *metacarpi* had been deboned. The cut-marks had been made oblique and asymmetrically being obvious on the anterior face. 1 *maxilla* of domestic cattle had been fleshed transversally, located behind the *premaxilla*. Another *carpi* of *Bos taurus* had been skinned on the latero-anterior face. The scratch is incomplete and also not so deep. It had been discovered 1 proximal end of a *metacarpus* having a cut-mark transversally and complete executed, from the anterior to it's posterior face.

Conclusions

As a summary, as well as for Chalcolithic period (Cucuteni A-B), in the Bronze Age and Iron Age of Vorniceni site (Botoșani County), the domestic mammals (cattle, sheep, goat) had been kept in the livestock long after the individuals riched their biologic maturity, in order to obtain mostly secondly products (wool, milk, hides, hair). The Chalcolithic butcher slaughtered old animals which provided primary products (internal organs and meat). In comparison, the pig was slaughtered as young individual, this domestic mammal offering a lot of lard, bacon, meat and internal organs. A very few individuals had been sacrificed as old individuals (those being kept in the livestock for breeding period).

INTERPRETAREA ARHEOZOOLOGICĂ A URMELOR DE MĂCELĂRIRE EVIDENTE DE PE RESTURILE SCHELETICE DE MAMIFERE DOMESTICE DE LA VORNICENI (JUDEȚUL BOTOȘANI)

Cuvinte-cheie: *arheozoologie, Vorniceni, eneolitic, Cucuteni A-B, epoca bronzului, cultura Noua, epoca fierului, Hallstatt, mamifere domestice, preferabilitatea hranei, măcelărire, tăieturi.*

Rezumat

În prezentul studiu au fost descrise urmele de măcelărire evidente de pe resturile scheletice de la mamiferele domestice cu importanță în paleoeconomia comunităților umane din cadrul sitului de la Vorniceni-Pod Ibăneasa (județul Botoșani). Cercetările arheologice au evidențiat niveluri de locuire datând din eneolitic (faza Cucuteni A-B), epoca bronzului (cultura Noua), epoca fierului (Hallstatt) și perioada migrațiilor. Sunt comparate și interpretate din perspectivă arheozoologică tipul de lovitură, tăietură evidentă pe resturile scheletice craniene și postcraniene de mamifere domestice, care oferă indicii cu privire la preferințele alimentare (organe interne sau carcase).

LISTA TABELELOR ȘI ILUSTRAȚIILOR

LEVEL		CHALCOLITHIC (CUCUTENI A-B)								
SPECIES		*Bos Taurus*		*Ovis aries*		*Capra hircus*		*Sus domesticus*		Total
	TRACES	no.	%	no.	%	no.	%	no.	%	no.
SLAUGHTERING	Deboning	330	19.54	60	12.5	18	9.83	32	5.58	440
	Skining	8	0,47	15	3.12	5	2.73	15	2.61	43
	Fleshing	393	23.28	121	25.20	50	27.32	165	28.79	729
	Disarticulation	245	14.51	42	8.75	15	8.19	55	9.59	357
	Evisceration	350	20.73	107	21.66	71	38.79	60	10.47	585
	Conservation	17	1.07	12	2.50	6	3.27	12	2.09	47
	Total	**1343**		**354**		**165**		**339**		**2201**
COOKING	Black burnt	100	5.92	60	12.5	9	4.91	123	21.46	292
	White burnt	57	3.37	23	4.79	2	1.09	13	2.26	95
	C. gnawed	124	7.34	33	6.87	6	3.27	72	12.56	235
	R. gnawed	64	3.79	9	1.87	1	0.54	26	4.53	100
	Total	**1688**		**480**		**183**		**573**		**2924**

Tab. 1. *Vorniceni-„Pod Ibăneasa". Distribution of the traces of slaughtering obvious on domestic mammals skeletal remains in Chalcolithic (Cucuteni A-B).*

SPECIE	TYPE BLOW CUT-MARK / SKELETAL ELEMENTS	PERFORATION	TRANSVERSALLY	LONGITUDINALLY	CUT-MARK LEFT SIDE	CUT-MARK RIGHT SIDE	TOTAL
Ovis aries (sheep)	Skull	1 (S. 11) 1 (L. 8) 1 (L. 15) 1 (Gr. 40)	1 (Cas. B) 1 (S. 11) 1 (S. 21) 1 (L. 5) 2 (L. 11)	1 (L. 2) 1 (L. 8) 3 (Gr. 25)	1 (L. 11) 1 (L. 14)	1 (L. 11) 2 (Gr. 40) 3 (Gr. a-b)	23
	Hyoid	–	–	–	1 (S. 8)	–	1
	Costo-sternal cartilage	–	1 (Gr. 32) 1 (Gr. 21) 1 (S. 8)	4 (S. 11) 1 (L. 8) 4 (L. 15) 1 (Gr. a-b) 2 (Gr. 34)	1 (Gr. 27) 2 (Cas. A) 3 (L. 11)	9 (L. 14) 15 (Gr. 25)	45
	Sternum	–	–	–	–	1 (Gr. 25)	1
	Abdominal organs	3 (S. 14)	1 (Gr. 29)	–	1 (Gr. a-b) 1 (Gr. 34)	–	6
	Spinal marrow	2 (L. 14) 1 (Gr. 15) 1 (S. 11)	1 (Cas. A) 1 (Gr. 27)	1 (Gr. 21) 1 (S. 21) 1 (L. 7) 6 (L. 11)	2 (S. 11) 2 (Gr. 32)	–	19
	Bony marrow	2 (Cas. B) 1 (S. 15) 1 (L. 12)	1 (S. 8)	1 (*passim*) 1 (S. 21) 1 (Gr. 27)	1 (S. 2) 2 (L. 8)	1 (S. 11)	12
	Total	**15**	**13**	**29**	**18**	**32**	**107**
Capra hircus (goat)	Skull	–	1 (S. 21) 1 (L. 15)	2 (Gr.27) 3 (Gr 34) 1 (Gr.39)	1 (S. 11) 2 (L. 11) 1 (L. 8)	2 (L. 12) 3 (Gr. 40) 1 (Gr. 34)	18
	Hyoid	–	–	–	–	–	–
	Costo-sternal cartilage	–	1 (S. 8) 10 (Gr. 40)	5 (Gr. 37)	2 (L. 15)	1 (*passim*) 2 (L. 8) 3 (L. 14)	24
	Sternum	–	–	–	2 (S. 8) 3 (Gr. 34)		5
	Abdominal organs	–	1 (S. 15) 1 (L. 14)	1 (Gr. 25) 1 (Gr. 40)	4 (S. 11) 1 (Gr. 16) 1 (L. 8)	3 (L. 6) 2 (Cas. B)	15
	Spinal marrow	–	–	–	1 (Gr. 37)	–	1
	Bony marrow	4 (S. 8)	1 (L5)	1 (Gr. 12)	–	2 (S. 13)	8
	Total	**4**	**16**	**14**	**18**	**19**	**71**

Tab. 2. *Vorniceni-„Pod Ibăneasa". Comparison between skeletal remains eviscerated of the sheep and goat in Chalcolithic (Cucuteni A-B).*

TYPE BLOW CUT-MARK / SKELETAL ELEMENTS	PERFORATION	TRANSVERSALLY	LONGITUDINALLY	CUT-MARK LEFT SIDE	CUT-MARK RIGHT SIDE	TOTAL
Skull	–	3 (Gr. 27) 1 (Gr. 32) 3 (L. 14) 1 (Gr. 22) 1 (S. 22) 2 (Gr. a-b)	3 (Gr. 25) 1 (L. 14) 1 (Cas. B)	2 (S. 11) 5 (L. 15) 1 (Gr. 40)	5 (S. 11) 1 (S. 13)	**30**
Hyoid	–	–	1 (Gr. 27)	2 (L11)	1 (Gr. 42)	**4**
Costo-sternal cartilage	–	1 (S. 22) 2 (Gr. a-b)	–	–	–	**3**
Sternum	–	–	1 (L. 12)	–	–	**1**
Abdominal organs	–	1 (L. 7) 1 (Gr. a-b)	1 (L. 6) 1 (L. 8)	1 (Gr. 42)	2 (L. 11)	**7**
Spinal marrow	–	–	–	1 (S. 11)	–	**1**
Bony marrow	2 (L. 6) 1 (Gr. 16)	3 (S. 11) 1 (L. 6) 1 (S. 14)	–	4 (S. 11) 1 (Gr. 35)	2 (S. 11)	**15**
Total	**3**	**21**	**9**	**16**	**11**	**60**

Tab. 3. *Vorniceni-„Pod Ibăneasa". Evisceration cut-marks on skeletal remains of pig in Chalcolithic (Cucuteni A-B).*

LEVEL		BRONZE AGE (NOUA CULTURE)					
SPECIES		*Bos taurus*		*Ovis aries*	*Capra hircus*	*Sus domesticus*	TOTAL
	TRACES	no.	%	no.	no.	no.	no.
SLAUGHTERING	Deboning	29	14.87	12	3	3	47
	Skining	5	2.56	1	1	2	9
	Fleshing	52	26.66	15	2	4	73
	Disarticulation	34	17.43	7	2	8	51
	Evisceration	24	12.30	19	3	4	44
	Conservation	7	3.58	–	1	1	9
	Total	**151**		**54**	**12**	**22**	**233**
COOKING	Black burnt	23	11.79	2	–	2	27
	White burnt	8	4.10	–	2	1	11
	C. gnawed	6	3.07	3	–	1	10
	R. gnawed	7	3.58	–	2	2	11
	Total	**195**		**59**	**16**	**28**	**292**

Tab. 4. *Vorniceni-„Pod Ibăneasa". Traces of slaughtering on domestic mammals skeletal remains in Bronze Age (Noua culture).*

Fig. 1. *Vorniceni-„Pod Ibăneasa”.*
Skull of domestic cattle with traces of evisceration (Cucuteni A-B)
(photo: F.C. Oleniuc).

Fig. 2. *Vorniceni-„Pod Ibăneasa”.*
Pathological mandible of sheep with fleshing traces (Cucuteni A-B)
(photo: F.C. Oleniuc).

Fig. 3. *Vorniceni-„Pod Ibăneasa”.*
Horn-cores of domestic goat with evisceration and split traces (Cucuteni A-B)
(photo: F.C. Oleniuc).

Fig. 4. *Vorniceni-„Pod Ibăneasa”.*
Bones of pig with slaughtering traces (Cucuteni A-B)
(photo: F.C. Oleniuc).