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VERTEBRATE FAUNA OF VINČA – BELO BRDO (EXCAVATION CAMPAIGNS 1998–2003)

Abstract. – Vertebrate remains from the Late Vinča layers of the site Belo Brdo in the present day village of Vinča are studied. These include the bones of mammals, birds, tortoises, fish, in addition to mollusc shells. The most important are remains of mammals, among which domestic animals slightly outnumber game. Five species of domestic animal are present: dog, and four economically important species – cattle, pigs, sheep and goats. Cattle bones preponderate within domestic animals, but pig remains are also numerous. Red deer, wild boar and roe deer are the most frequently hunted prey. Birds were rarely hunted, but fishing was a regular activity. Occasionally, tortoises and river clams were collected as an additional food supply.

Key words. – Late Vinča, Neolithic, Belo Brdo, vertebrates, archaeozoology.

Renewed excavation of the eponymous and most important locality of the Neolithic Vinča culture, Belo Brdo (White Hill) in the present day village of Vinča, began in 1998. Besides gaining a thorough insight into the site topography, stratigraphy and material culture, this research is aimed at elucidating those aspects that missed close attention in the course of previous research, mostly because of the state of development of research methodology. This relates above all to the economy of prehistoric society and to the exploitation of natural resources, issues in the interpretation of which archaeobotanical and archaeozoological studies should play a central role.

In the course of the excavations conducted by Miloje Vasić (1908, 1911–1913, 1924, 1929–1934)[1] an extensive area was opened and excavated from the top of the tell down to the earliest levels of the 10.5 m thick cultural layer. Animal bones were not collected. They are, after the pottery, the most frequent material at the Vinča – Belo Brdo site, yet in his memoirs devoted to presentation of the material collected during his long-term excavations, Vasić[2] did not reserve a single paragraph, nor indeed a single complete sentence, to animal remains. Animal bones are only mentioned several times in passing, for example in the description of the content of the pit-dwellings from the layer ∇9,10 to ∇10,50 m, or as raw material for artefact production. Vasić's sole mention of economics is his comment on the primitive state of the pre-Vinča people: »autochthonous, besides herding products (meat, milk, cheese etc.), they fed on the fruits of various trees, and did not even need fire to prepare this food«[3].

This relates to Vasić's belief that Vinča was an Ionian colony, thus not a prehistoric culture but part of the Classical world; he did not believe the economy of the Vinča people to be a very interesting or important issue. As a consequence, from this first phase of research all the information we have about the undoubtedly very important field of human/animal interactions is based only on impressions gained from art and cult items, and indirectly from the artefacts.

In the second phase of research (1978–1986) the excavation area was adjacent to that excavated by Vasić. Horizons relating to a Mediaeval necropolis, Bronze Age and Eneolithic cultures were excavated. The excavation was stopped at the level of the Vinča culture. This phase of research saw the first collection of faunal remains at Vinča. Osteological material is stored in the storehouse at the site, and when thoroughly analysed is expected to provide important data on all the prehistoric cultures that left traces at the

[1] Garašanin 1979.

[2] Vasić 1932, 1936a, 1936b, 1936c.

[3] Vasić 1936c, 147.

Belo Brdo hill after Vinča culture. Archaeozoological remains from the Vinča culture layer were analyzed by Bökönyi[4], and the mandibles of domestic species examined for age profiles by Arnold & Greenfield[5]. The frequency distribution of the domestic and main wild animal species given by Bökönyi shows important discrepancies with those presented here. This indicates the complexity of the site, demonstrating that even the large sample analysed may not be representative for the whole site, i.e. that the archaeozoological material presents a dynamic picture moving both vertically through the layers and horizontally through different parts and units of the settlement.

Although there are many excavated localities in the vast territory of the Vinča culture, archaeozoological analyses have been carried out on rather a small number of them. Besides Vinča – Belo Brdo, lists of species are known from the following Neolithic localities in Serbia: Lepenski Vir III[6], Nosa – Biserna obala[7], Ludoš – Budžak[8], Gomolava[9], Padina B[10], Starčevo[11], Gologut[12], Petnica[13], Boljevci[14], Divostin[15], Selevac[16] and Opovo[17]. Sites differ by size, duration of occupation, and social and economic status. Consequently, there are differences in faunal composition, the proportion of domestic and hunted animals, patterns of animal exploitation and other faunal characteristics.

METHODOLOGY AND TAPHONOMY

From the beginning of the field research in 1998, faunal remains have been unselectively collected during the excavations, meaning that all observed fragments of animal bones and invertebrate shells were retained. In the course of the 2001 campaign flotation of samples from selected units began. Although the main aim of flotation is the separation of organic materials of plant origin, this method also yields both the remains of small vertebrates and small fragments of large mammal bones that were overlooked during hand-collection. It thus allows for checking and correction of the data obtained from the fauna gathered without flotation. However, the flotation material is not included in this study, since its separation and sorting has not yet been completed.

The excavation strategy changed in the course of the 2003 excavation season in the sense of recording field data. The previous strategy was to collect material with a record related to a horizontal grid. This was subsequently changed to the so-called unit system in which a unit is contextually defined. This study is related to faunal material collected according to a horizontal grid from the beginning of the 1998 excavation season until the change in the recording system in the 2003 excavation season.

The faunal remains are well preserved, mainly without signs of postdepositional physicochemical decomposition. A small part of the faunal material shows traces of weathering caused by exposition to atmospheric influences before being buried in the sediment. Only 7 % from the total amount of more than 20,000 specimens of mammal bones are characterized by changes deriving from surface weathering. These are mostly foliation of the periosteum and slight cracking of the compact bone[18], while more advanced weathering is rare. The colour of the bones is predominantly grey or dark grey, though many fragments show staining related to the microdepositional environment – shades of red indicate contact with zones of burned clay, greenish colouring indicates the presence of metal, while red, black and white colours originate from burning. Among burned fragments, which represent 6 % of the total number of specimens, there are calcified, carbonized, burned and partly burned specimens. There is no particular regularity in their distribution, but they are found on the whole researched area. As is common for Neolithic localities, there are few complete bones, no complete skeletons nor articulated skeletal parts, and very few elements attributable to the same skeleton. Fragmentation is the consequence of animal butchery, stripping the meat from bones, breaking bones to obtain bone marrow, or using them as raw material. Disposal of bones contributed additionally to the fragmentation of the material, while animal gnawing also played a part.

The archaeozoological analysis aims to identify all the gathered specimens in terms of skeletal element

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4 Bökönyi 1990.
5 Arnold & Greenfield 2006.
6 Bökönyi 1969.
7 Bökönyi 1974, 1984.
8 Bökönyi 1974.
9 Clason 1979.
10 Clason 1980.
11 Clason 1980.
12 Блажић 1984
13 Greenfield 1986, 1991.
14 Lazić 1988.
15 Bökönyi 1988.
16 Legge 1990.
17 Russell 1993.
18 Stage 1 after Behrensmeyer 1978.

and taxon, to define sexes and individual ages and to record all traces on the bones caused by human interactions with animals or their remains. Contextual analysis is not performed here. This is due to the very complex situation found in the excavation area, caused by the foundations of houses from the later habitation level. Foundation traces, ditches and rows of post-holes from several features intersect each making it virtually impossible to separate material into related units.[19]

FAUNAL COMPOSITION

Faunal remains collected at the Belo Brdo locality comprise the bones of mammals, birds, tortoises, fish, as well as mollusc shells (table 1).

The distribution of various classes of vertebrates and freshwater molluscs is given by NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals). Although NISP and MNI in table 1 give a general picture of the proportions they are not directly comparable, as they are based on different criteria for different vertebrate classes or molluscs. Mollusc shells are counted for NISP if a beak in bivalves or an apex in snails has been preserved. MNI is evaluated on the base of the greater number of left or right valves in bivalves. This is identical for the NISP of snails. Tortoise remains are presented separately, because they represent by far the most numerous remains among both amphibians and reptiles, and the rest of the herpetofauna is mostly not identifiable to species. Their MNI is established according to one plate of the armour. Birds and fish remains await specific identification and specialist analysis to provide their MNI.

Freshwater bivalves and freshwater and terrestrial snails are presented since they possibly contributed as food resources. The figures relate to molluscs hand collected in the course of the excavation, and not to those collected by flotation. The latter are, small forms, important as environment indicators, but certainly not as food sources. Also, marine and fossil mollusc remains are not presented here, as they originate from outside the environment and played a different role in the life of man from the rest of the fauna.

The taxonomic composition of the mammal fauna is given in table 2. Frequency distribution of various taxa is expressed by the number of identified specimens, diagnostic zones and minimal number of individuals (table 2).

The number of identified specimens (NISP) includes all specimens ascribed to particular taxon, with the exception of mid-section fragments from cattle, sheep and goat horn-cores, and deer antler splinters. These are excluded because counting every horn-core and antler fragment would bias the proportion of taxa in favour of bovids and cervids. Horn-cores and antlers are apt to break into many pieces, yet most often fragments remain identifiable to species due to theirs structure, while analogous broken small pieces of bones are unidentifiable. Morphologically important fragments were still counted, like basal fragments of horn-cores with fragments of frontal bone, tips or any part of a horn-core with complete circumference, as well as fragments of the basal portion of cervid antler – rose, or any portion of an antler beam or tine with complete circumference. Further, the method of counting diagnostic zones[20] is employed in order to comprehend proportions of taxa. Similar elements are counted in all taxa, thus avoiding biased proportions resulting from anatomical differences (for example five metapodials in dog versus the single metapodial in sheep). Diagnostic zones were counted for upper and lower fourth permanent premolar alveolus or deciduous last molar alveolus, atlas, axis, distal scapula, pelvic acetabulum, proximal and distal humerus, femur, radius and tibia, proximal ulna, astragalus, calcaneus, and proximal and distal third metacarpal. Finally, the minimal number of individuals (MNI) was counted on the basis of the most frequent element of a particular taxon, or combined age and/or sex differences within the most frequent element.

DOMESTIC ANIMALS

Domestic animals outnumber game, although this prevalence is not very accentuated (fig. 1a). They produced the most important, and most reliable meat supply. Four species compose this »food producing fund«: cattle, pigs, sheep and goats.

The share of domestic animals among the mammal remains recovered at the site and the relative proportions of particular species of domestic animals is difficult to state precisely as it is not always possible to differentiate domestic animals from their wild progenitors, particularly in the case of cattle and pigs, and to distinguish separate species in the case of sheep and goats.

Cattle are one of the most frequent species, if we consider all remains ascribed to the cattle genus, whether

[19] Tasić 2005.

[20] Watson 1979.

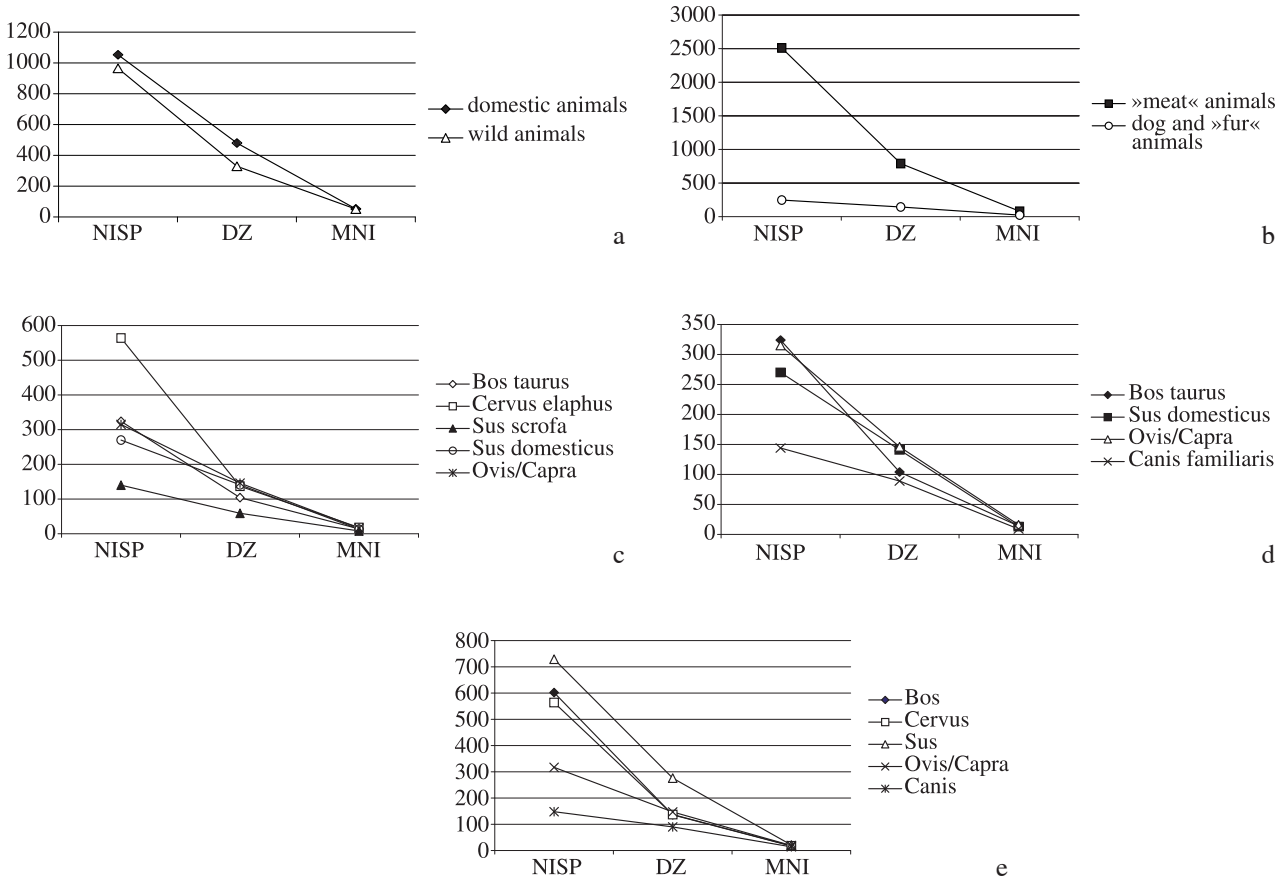

Fig. 1. Distribution of various classes/taxa of animals expressed as NISP (number of identified specimen), DZ (number of elements with diagnostic zones) and MNI (minimum number of individuals): a) domestic versus wild animal species; b) meat animals versus non-meat (dog and »fur«) animals; c) distribution of the five most important meat taxa; d) distribution of domestic animals; e) distribution of the five most important genera

Сл. 1. Заступљеност различитих класа/таксона животиња изражена бројем одређених примерака (NISP), бројем елемената са дијагностичким особинама (DZ) и минималним бројем јединки (MNI): а) домаћих и дивљих животиња; b) животиња које се превасходно користе за исхрану насупрот животињама које се користе у друге сврхе (пас и »крзнашице«); c) пропорционална заступљеност пет врста животиња које имају најважнију улогу у исхрани месом; d) пропорционална заступљеност домаћих животиња; е) пропорционална заступљеност 5 најчешћих родова

identified as domestic cattle, *Bos taurus*, the wild progenitor, aurochs, *Bos primigenius*, or specifically undetermined – *Bos* sp. The wild form contributes the least: only 8 bones have been found that have been positively ascribed to aurochs, on the base of undeniable size differences (fig. 2). Although the number of the cattle bones identified as *Bos* sp., i.e. impossible to recognize either as domestic or wild form, is rather high, this is rather the consequence of the high fragmentation rate and low number of measurable specimens than the possibility that many more remains of wild cattle are hidden among them. The rather high percentage of DZ in *Bos* sp. (27) includes juvenile specimens (13), which most likely belong to domestic cattle, and also immeasurable specimens like mandibles counted even if only P4 or D4 alveoli were present, or damaged pelvic bones. However, in several instances morphometric separation was not possible due to intermediate size between domestic and wild form (Fig. 3).

The appearance of intermediate size individuals between populations of domestic and wild cattle is common at the sites of the Vinča culture in the region. Sometimes, this has led to assumptions that it is the consequence of local domestication, which was reflected

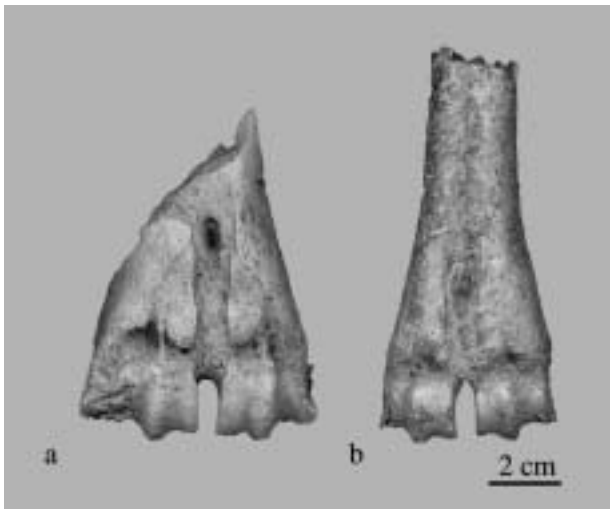

Fig. 2. Cattle distal metatarsals: a) Bos primigenius, aurochs, Mt sin.; b) Bos taurus, domestic cattle, Mt dext

Сл. 2. Дисшални мешашарзус їовечеша: а) Bos primigenius, шур, Mt sin.; b) Bos taurus, домаће їовече, Mt dext

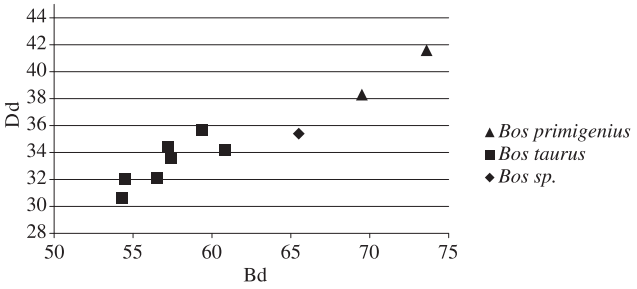

Fig. 3. Distal metatarsal breadth (Bd) and depth (Dd) relationship of domestic cattle and aurochs

Сл. 3. Однос између највеће ширине (Bd) и дебљине (Dd) дисшалної зїлоба домаћеї їовечеша и шура

by an initial phase in which domestic animals' size diminished in relation to that of wild animals. However, the presence of intermediates may also mark the overlap in size of large males of domestic species and small females of wild species. For example, at Selevac near Smederevska Palanka, alongside a clearly separated group corresponding to domestic females and very large specimens representing male aurochs, a group of intermediate size is found, encompassing wild cattle females and domestic males.[21] A similar situation is observed at other sites of the Vinča culture in Serbia.[22]

The domestic cattle at Vinča – Belo Brdo are a large bodied form similar in size to cattle from other sites of the Vinča culture. Both the variation ranges and means are similar to the Late Neolithic cattle of Selevac, Divostin, and Opovo.[23] Specimens of different skeletal elements mostly cluster in a larger group of smaller individuals that probably represent females, and a few larger specimens probably belonging to males (Table 3).

The ageing of cattle remains shows a prevalence of immature animals. Age structure was observed on mandibles, specifically on those specimens that contained D4 or P4 alveolus. Out of 14 mandibles with P4 or D4 alveoli only 5 have all permanent teeth erupted and in rear, and thus belonged to adult animals. The remaining mandibles belong to young animals at different stages of development, as if there was no young age predestined for slaughtering. Permanent teeth, especially the last third molar, show that few animals were exploited to the end of their natural life.

Pig remains are numerous, and if anything deviates from the expected picture of animal husbandry at Vinča – Belo Brdo then it is the high percentage of pig, both among domestic animals and that of all pig remains among all large mammals. Among domestic animals pigs are the second best represented domestic species (Fig.1d). Domestic, wild and specifically unidentified remains of pig comprise the most represented genus among large mammals (fig. 1e). The frequency distribution found by Bökönyi[24] differs: cattle are by far the most frequent species among domestic animals (approximately 60 %)[25], then come sheep and goats, and only then pigs. On the majority of Neolithic sites in the region the situation is also different, since, while pigs are always present, they are almost never present in such great numbers. The exception is Opovo, where the pig outnumbers all domestic animals.[26]

In contrast to the situation with cattle, the majority of domestic and wild pig remains are rather easily distinguished, due to obvious differences in size in both teeth and postcranial skeleton (table 4, fig. 4, 5 and 6). Postcranial bones and tooth rows show no overlap in size. Not only tooth rows but also isolated teeth proved possible to ascribe to either the domestic or the wild

[21] Legge 1990.
[22] Clason 1979, Russell 1993.
[23] Bökönyi 1988, Legge 1990, Russell 1993.
[24] Bökönyi 1988.
[25] Bökönyi 1988, Abb.1.
[26] Russell, 1993.

form. Even milk teeth are distinguishable (fig. 5). Considerable size differences between the domestic and wild forms have also been established at other Neolithic sites in Serbia.[27] The percentage of pig specimens identified as *Sus* sp., that is undivided between domestic and wild forms, is nevertheless high, since it includes highly fragmented bones and most of the juvenile specimens. The juvenile animal remains and their identification, meanwhile, are key for understanding the percentage distribution of the two species. Were we to draw conclusions only on the basis of adult animals, it would seem that wild pigs were more numerous (for example, according to the number of the measured specimens of the third lower molar (Fig. 6)). However, if the first lower molar, which erupts early, is observed we find the opposite situation (Fig. 5). Therefore, it is assumed that the breeding of the domestic pig was directed at the slaughtering of young animals, while a small number of adults were retained for reproduction. With regard to the hunting of wild pig, it seems that mostly adult, mature animals were hunted.

The distribution of various age groups among pigs is best observed on lower jaws. Among 45 pig lower jaws that contained teeth, and could be attributed an individual age, only 10 belonged to individuals with complete dentition, 5 with the last molar in the first phase of wear (adult, but still relatively young), and only one with the last molar heavily worn, indicating an old animal. In the remaining 35 lower jaws, 18 with milk teeth were aged less than 6 months (according to the time of eruption of the first permanent molar[28]). In the next age group there are lower jaws with replaced milk teeth and erupted but unworn second permanent molars. Eight lower jaws in this group even have the same wear degree (MWS = 17–18[29]), indicating the simultaneous slaughter of a large number of animals. Various postcranial bones with unfused epiphyses also indicate the presence of several age groups among pig juveniles.

Skeletal remains, especially large cranial parts of pig and cattle, are found in concentrations in several places within the research area, again suggesting simultaneous butchery and treatment of large numbers of animals.

Sheep and goat are less well represented than cattle and domestic pig. Since wild progenitors of these species never lived in the surroundings of the site, remains of caprines can, without any doubt, be ascribed to domestic sheep or goats. In addition, other medium and small sized bovids, such as ibex or chamois, are excluded since the environment is not suitable for their survival.

Of course, there remains the issue of distinguishing sheep from goats, which is a common problem at archaeological sites. In fact, sheep and goat separation has advanced recently in more and more skeletal elements. Besides the classic papers dealing with this subject,[30] more recent publications are especially helpful in dealing with teeth.[31] Still, the category *Ovis/Capra* remains quite numerous, as it encompasses all highly fragmented and uncharacteristic skeletal elements. As at most other Neolithic sites it appears that sheep are more numerous than goats. Among 32 lower jaws specifically identified, 25 belong to sheep, and 7 to goats. Accordingly, their ratio calculated based on mandibles is 3.5 : 1. Nevertheless, the proportions look different when different skeletal elements are taken into consideration. For example, if we consider tibia, astragalus, or metapodials, the proportion changes to as much as 13 : 1. It is obviously not easy to define sheep/goat proportions. This is also the

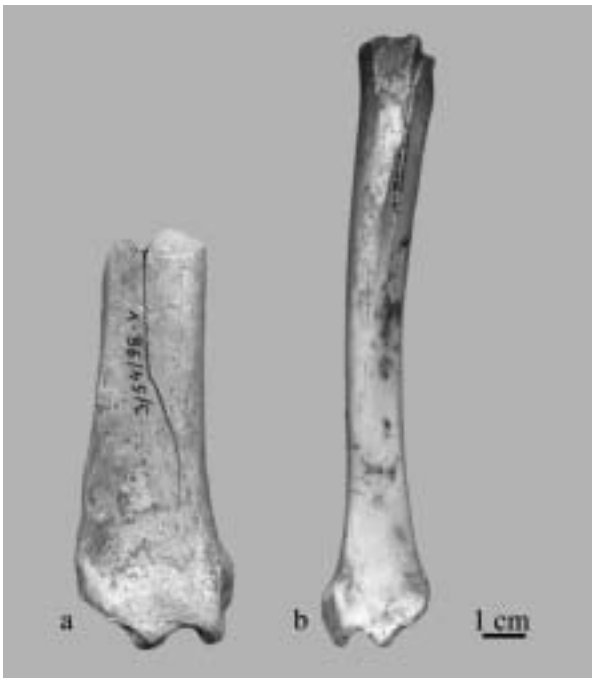

Fig. 4. Sus sp., tibia: a) Sus scrofa, wild pig, right distal tibia; b) Sus domesticus, domestic pig, left distal tibia

Сл. 4. Sus sp., тибија: а) Sus scrofa, дивља свиња, дисталнu зглоб десне тибије; б) Sus domesticus, домаћа свиња, дисталнu зглоб леве тибије

[27] Bökönyi 1988, Clason 1979, Legge 1990, Russell 1993.

[28] After Matschke 1967, from Bull and Payne 1982.

[29] After Grant 1982.

[30] Boessneck & Teichert 1964, Громова 1953, Prummel & Frisch 1986.

[31] Halstead & Collins 2002.

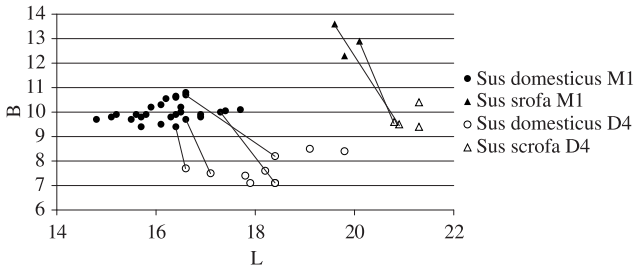

Fig. 5. Pig lower D4/M1. Domestic and wild pig last decidous molar and first true molar length (L) and breadth (B) plots. Teeth from the same jaws are connected with solid lines

Сл. 5. Однос између дужине (L) и ширине (B) последњег млечног (D4) и првог сталног (M1) доњег молара домаће и дивље свиње. Зуби из исте вилице повезани су линијама

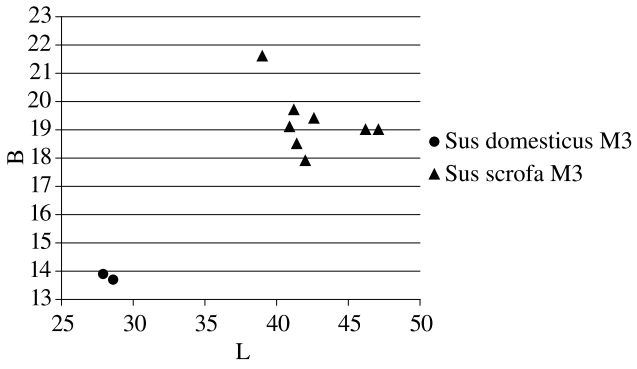

Fig. 6. Relationship of domestic and wild pig third lower molar length (L) and breadth (B)

Сл. 6. Однос између дужине (L) и ширине (B) трећег доњег молара домаће и дивље свиње

case at other localities, even when very large samples are presented, for example at Kastanas.[32] Still, it is safe to conclude that in sheep and goat herding the widely accepted strategy throughout prehistory and even until recent times was also employed at Vinča, that a few goats were herded alongside larger numbers of sheep.

The age distribution based on mandibles with D4 or P4 alveoli preserved indicates that less than one quarter of sheep attained fully grown age. This indicates that orientation towards exploitation of milk and wool is highly improbable, while it seems likely that herding was primarily undertaken for meat production. At the same time, the age structure is different from that of the domestic pig, in that the youngest animals are not present at all. There are no mandibles with only milk teeth, or with the first permanent molar M1 still in the process of eruption, i.e. remains of animals between birth and three months old. The most numerous are specimens aged from 9 months to 2 years, i.e. mandibles characterized by the eruption of the second and third lower permanent molar. The absence of the youngest age groups is also observed by Arnold and Greenfield[33] in their study of transhumant pastoralism based on the mandibles derived from the 1982 excavations at the site.

Only two horn-cores are preserved, one sheep and one goat. The sheep horn-core is short and probably comes from a young animal, while the goat horn-core is long and straight, the so-called »aegagrus« type which is considered characteristic for more primitive breeds of goat.

The size of the sheep, as illustrated by whithers height of 47.8–56.0 cm calculated on four metacarpals[34], indicates a breed of small size, common in the Neolithic. The small Neolithic breed of sheep is replaced by a larger breed in the Bronze age, which is considered to have been herded primarily for wool production. Exploitation for the sake of wool production is not easy to prove even on much more abundant material[35]. At Vinča, the small percentage of sheep and goats in relation to cattle and pig remains does not point to wool production. The representations of clothes in Vinča figurines do not, on the whole, give any indication of fabric quality, but when they do they point to a fine delicate fabrics, more likely to have been made of linen than of wool.

A whithers height established for goat on the basis of a single radius is 48.3 cm[36], i.e. very small, although the goat bones are mostly more robust than sheep[37].

Apart from domestic species primarily bred for meat production, remains of dog have also been collected at Belo Brdo. Dog remains comprise 5.2% of NISP and 9.5% of DZ. The fragmentation rate pattern differs from meat animals with occasional occurrences of complete long bones, which are almost completely absent in the former species. All skeletal elements are represented, with a slight under-representation of lower extremities.

Morphological features and skeleton size correspond to a clearly domesticated form of small to medium size.

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[32] Becker 1986, 45.

[33] Arnold & Greenfield 2006, table 7.45.

[34] According to parameters given by Teichert 1975.

[35] For example Kastanas in Greece, Becker 1986.

[36] Based on parameters given by Schramm 1967.

[37] See tibia, metatarsal and astragalus measurements in Table 5.

Fig.7. Dog cranium with impact blow on the forhead: a) dorsal view; b) basal view

Сл. 7. Лобања пса са трагом ударца на челу: а) дорзално; б) базално

One complete and four fragmented crania were recovered. The complete skull (fig. 7) belonged to a young adult animal. The animal probably died from a strong blow dilivered to its forehead. Pieces of broken frontal bone are still in place, and breakages at the point of impact are old. The breakages are unlikely to be postdepositional, so it could be concluded with quite a high degree of certainty that the animal died as a result of this probably deliberate blow. Out of four remaining crania fragments, three belonged to young adults, and one to an old animal, with worn tooth crowns and partial burning.

The mean value of 20.01 mm for lower first molar length is based on ten measured specimens (Table 6).

The whithers height on the base of three long bone lengths (single humerus, radius and ulna) is 41.9 – 50.2 cm.[38]

As usual at Neolithic sites, the presence of dogs is evident not only from skeletal remains but also on the basis of large numbers of gnawed bones. Traces of gnawing are present on 9 % of all bones. Although other animals are known to gnaw bones (e.g. pigs or even ruminants such as goats and deer), most of these are traces made by dog teeth. The percentage of gnawed bones is larger if only specifically identified specimens are considered, since they comprise proportionally more joint fragments and almost no diaphyses which are numerous among unidentifiable specimens. The gnawing rate lies between 15 to 20 % for most species, but attains approximately 39.5 % in dog bones.

On the basis of butchering traces on dog bones, it seems that dog meat was occasionally consumed. Cuts on dog bones are recognized as butchering marks on vertebrae, for example on the transverse process of a lumbar vertebra found with two other articulated lumbar vertebrae (fig. 8). One of the vertebrae bears traces of fire on the broken ends of the transverse processes which also points to possible roasting of pieces of dog meat. The percentage of dog bones with various traces of fire, from completely calcined to partly burned specimens, is rather high at 14.5 %.

THE ROLE OF HUNTING IN THE ECONOMY

Wild animals represent a significant part of the faunal material (fig. 1a). A considerable number of species is found, while on the basis of the large quantity of remains it can be presumed that hunting played an important role in meat supply (fig. 1c). Supply of other useful materials from various wild animal species, such as antler and bone for artefact production, or fur and leather, was certainly also significant.

Red deer is the best represented hunted species. In fact, it is the most highly represented species both by NISP and by MNI (table 3; fig. 1c). The numbers probably somewhat overestimate the prevalence of deer: some of the domestic cattle and pigs are hidden in the »sp.« groups, while identification of red deer presents no such problem since no other species is of the same size and morphology simultaneously: roe deer share similar morphology with other deer species but are of much smaller size, while only cattle are sometimes comparable in size, but in most cases have clearly distinct morphology.

The most numerous skeletal elements are fragments of antlers and extremity bones that also represent the material most often used for artefact manufacture. Meat bearing bones are also well represented, while many filleting marks provide evidence for extensive red deer meat consumption. The presence of all parts of the skeleton shows that animals were hunted in the vicinity and

[38] According to parameters given by Harcourt 1974.

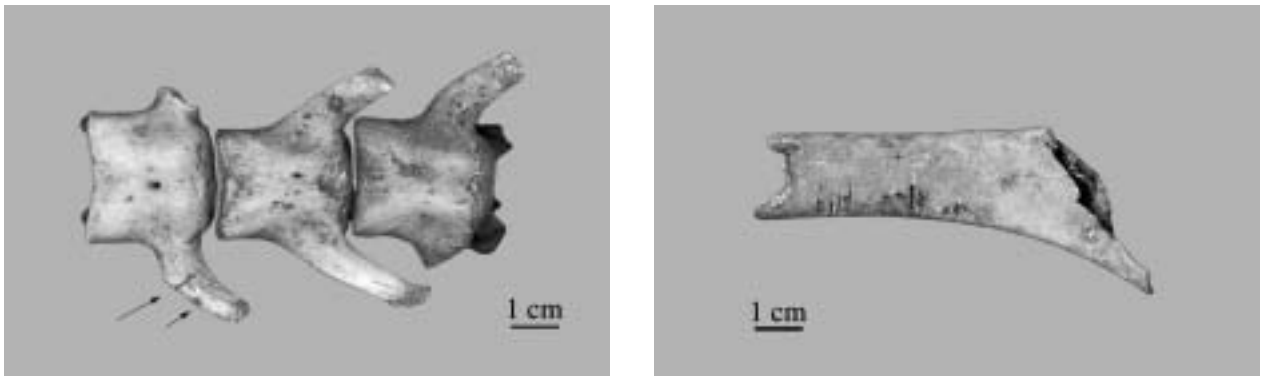

Fig. 8. Dog lumbar vertebrae with cut marks (indicated by arrows) and burnt transversal process endings
Fig. 9. Red deer hyoid with cut-marks

Сл. 8. Слабински пршљенови пса са урезима (означени стрелицама) и наугорелим крајевима попречних наставака
Сл. 9. Хиоидна кост јелена са урезима

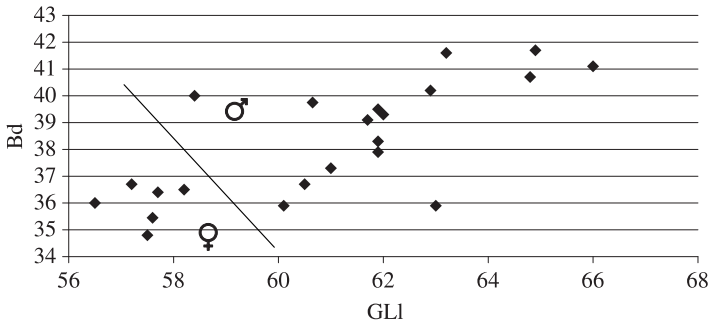

Fig. 10. Red deer astragalus lateral length (GLl) and distal breadth (Bd) plots

Сл. 10. Однос између дужине (GLl) и дисталне ширине (Bd) астрагалуса јелена

often brought whole to the site. A few hyoid bones with cut marks (fig. 9) indicate that primary butchering was practiced at the site at least occasionally.

Hunting was orientated towards prime adults: out of seventeen counted mandibles (those that contained P4 or D4 alveolus) only four contained milk teeth, and those belonged not to the youngest but to the age close to the end of the first year of life, with M1 already showing wear and M2 visible in the crypt. Among mandibles with completed dentition (all permanent teeth in place), wear stages show a clear prevalence of adults, but not of old animals since very worn teeth are lacking.

Sex ratio is not possible to determine on the basis of morphological traits since all skeletal elements showing these traits, such as the frontal parts of crania (with bone pedicles in males and without them in females), or innominate bones, are highly fragmented. Nevertheless, the large difference in size between the two sexes (300 kg in males, and 120–150 kg in females in recent autochthonous populations of the Danube basin and Carpathians[39] is reflected in a bimodal distribution of measured values for various skeletal elements (fig. 10, table 7), showing that males prevail and that the sex ratio is close to 3: 1.

Another cervid species of importance for hunting is roe deer (table 8). All mandibles originate from adult animals, while only a few long bones are unfused – the hunt is oriented toward grown animals. It is also probable that males are preferred. The numbers of particular elements measurements are too small to show bimodal distributions in relation to sex differences, but if one assumes similar size to that seen on other sites of the Vinča culture in Serbia, notably Opovo, where

[39] Group of authors, 1991.

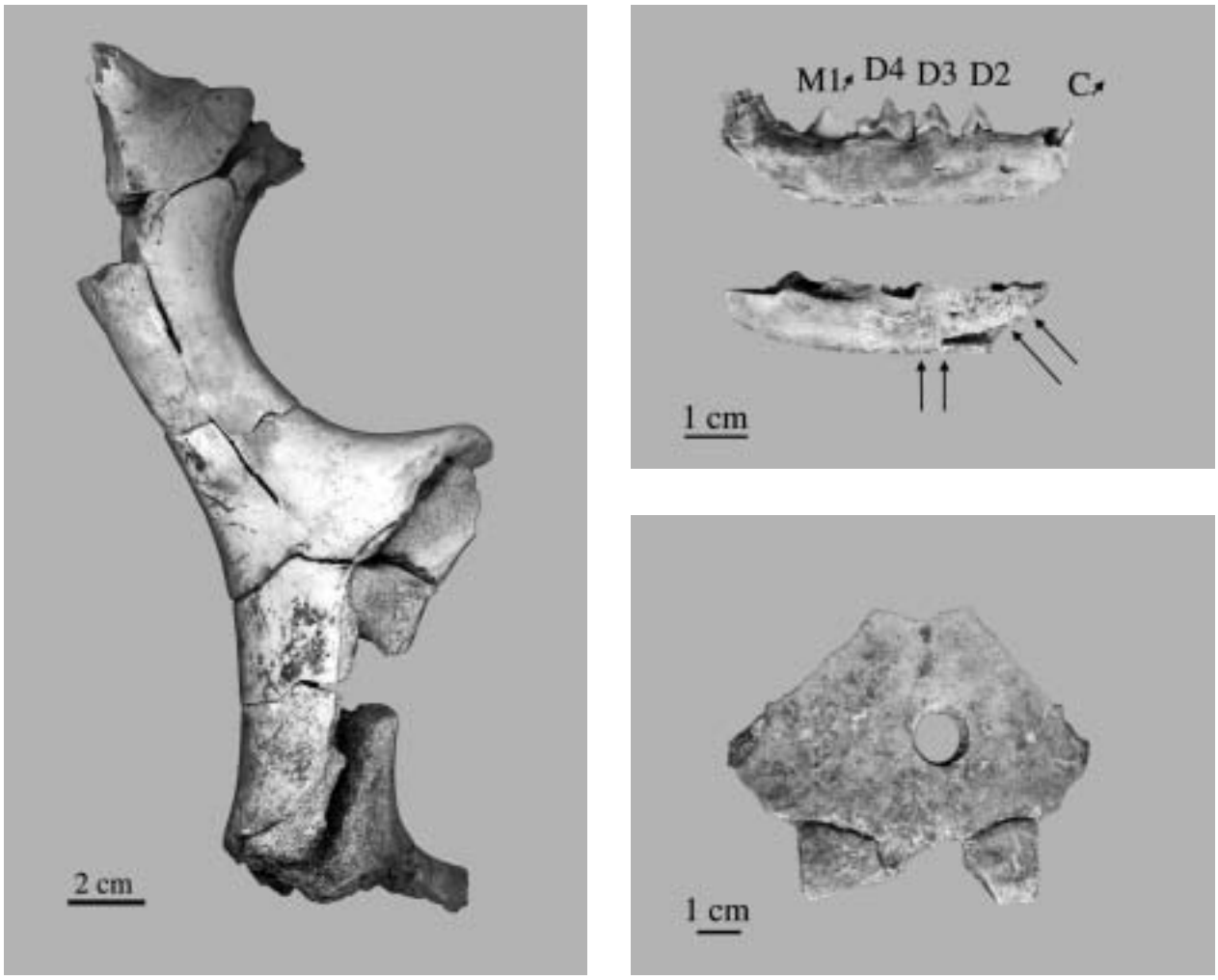

Fig. 11. Dama dama, fallow deer, fragmented antler
Fig. 12. Fox mandible with cut- marks (indicated by arrows). The better preserved specimen above is given for copmparison
Fig. 13. Tortoise upper shell (carapax) fragment with artificially bored hole

Сл. 11. Фрагментовани рог јелена лопатара (Dama dama)
Сл. 12. Доња вилица лисице са урезима (означени стрелицама). Боље очувани примерак (горе) приказан је због поређења
Сл. 13. Фрагмент горњег оклопа корњаче (карапакс) са пробушеним отвором

this differentiation is performed, a prevalence of males can be concluded.

Selection for grown animals and mostly males is probably the consequence of orientation towards meat supply as the aim of hunting, although acquisition of roe bone material for tool manufacture may also be of importance. Analogous to red deer, antlers and metapodial bones were favoured for tool manufacturing.

The third species of cervids found on the Belo Brdo site is fallow deer, *Dama dama*, which is a rare species in the Neolithic of Europe, and Serbia[40]. The fragmented branch of an antler was discovered (Fig. 11) but with tine bases damaged to the extent that one cannot tell whether they were cut off. Separately one more tine was found, which was modified into a tool. The fact that only antlers are found may be of importance. It is possible that fallow deer did not live in the surroundings and

[40] Bökönyi 1971, Russell 1993.

were not hunted by the Vinča settlers, but that antlers and/or antler artefacts were traded from a certain distance as exotic items.

The second wild animal according to its frequency is wild boar, and, as already mentioned, mostly adult animals were hunted.

The remaining wild animal species are rodents, lagomorphs (table 9) and carnivores (table 10), most of which were probably caught for fur, or as pests. Beaver is represented by few finds, while the remains of hare are somewhat more frequent probably since meat provided an additional reason for catching it. Mustelids are diverse, but mostly represented with few remains, otter by a single mandible.

A single bone, a calcaneus, illustrates the presence of wolf. Fox, again, is somewhat more frequent, and certainly its attractive fur was not neglected. A lower jaw shown in fig.12 shows traces of skin removal. One cranial and one maxilla fragment was found from brown bear. The highly worn teeth in the maxilla indicate a very old animal.

ADDITIONAL FOOD SUPPLY – FISH, BIRDS, TORTOISES, AND MOLLUSCS

Apart from mammal remains, which are evidently predominant, and played the most important role in meat supply whether originating from domestic or wild animals, the fauna also includes remains of other vertebrates, and invertebrates.

Birds did not contribute very significantly to the food supply, since only 55 bones have been found in the course of five excavation campaigns.

There are many more fish remains (NISP=995), and fishing is unequivocally demonstrated by some tools made of bone and antler, especially harpoons and hooks. Both the fish remains themselves and the size of harpoons and hooks indicate fishing for large species, which is to be expected considering the settlement's position on the bank of the Danube. There were no concentrations of fish bones in the excavation area, which would have indicated specialized working places for processing fish food, but fish remains were scattered throughout the settlement, mixed with bones of other vertebrates.

The presence of a relatively large number of bone plates of tortoises (*Testudo* sp.) is intriguing, as are the numerous shells of clams (*Unio* sp.), which indicate that alternative sources of food were sometimes utilized. Time and future excavations will show whether this was characteristic for one particular phase of Vinča settlement, as revealed in the five-year campaign, or whether tortoises and clams represent a constant component of the economy at the Belo brdo locality.

Remains of tortoise are quite numerous (NISP = 337). Mostly fragments of tortoise armour are found, some of them consisting of several fused plates of carapace or plastron. On the basis of the most frequent element, left hypoplastron, a minimal number of fourteen animals is calculated. The morphology of some characteristic plates of carapace points to the smaller and more tolerant of the tortoise species present in the European Holocene – *Testudo hermanni*. Tortoises have a habit of digging into the ground in the hibernation period but colour and bone structure burning of some of the plates, and old breakages on many fragments excludes the possibility that the finds represent intrusive recent animals, buried in the archaeological layer. Additional proof that the tortoise plates are synchronous with the archaeological layer derives from traces of fire observable on several specimens, and artificial modifications, such as a centrally positioned hole drilled in the plate of the carapace shown in fig. 13.

Tortoise plates were scattered throughout the excavation area, showing no important concentrations. Numerous bivalve shells (469) were scattered too, but also concentrated in piles in several places within the excavation area. Such piles resemble any pile of edible shellfish left after a meal. Although their consumption is not so widely accepted as their marine analogs, freshwater bivalves are also known to be eaten by people and sometimes used to feed animals, especially pigs. Shells are sometimes used by themselves, as an »ad hoc artefact« artefact, or crushed into dust as an additive to potters' clay, but this kind of use is not evidenced at Belo Brdo. Three species of clams are identified – *Unio crassus* Philipsson, *Unio pictorum* Linaeus and *Unio tumidus* Philipsson[41].

BONE AND ANTLER AS RAW MATERIAL

Manufacture of bone and antler tools was intensive and versatile at Belo Brdo. A great number of bones and antler tools was discovered, as well as a large number of preforms, fragments of bones and antlers rejected in the process of tool making, and those marked with various traces of modification coming either from

[41] Dimitrijević & Mitrović, in preparation.

the process of their manufacture or use, or from other interventions. Antlers of red deer are among the most favoured raw materials. Both shed antlers and antlers of hunted animals were used. Most antler tools were made for agricultural tasks, but antler was also used for fishing equipment as well as more universal tools such as hammers and points.

The majority of tools made from bones were manufactured out of bone material modified in such a way that identification of species and the skeletal element is impossible. Among bone artefacts with preserved articulations and other morphological elements enabling identification of the species or skeletal part, the most frequent are those made out of metapodials and long bones of red deer, as well as of roe deer, and of domestic animals such as cattle and sheep. The most frequent tool type is the point.

CONCLUSIONS

Faunal remains collected in the course of the 1998–2003 campaigns at the Belo Brdo locality, include the bones of mammals, birds, tortoises and fish, as well as mollusc shells. In the mammalian fauna the most numerous are the remains of domestic animals: cattle, pigs, sheep, goats, and dogs. Among the hunted species there are red deer, roe deer, fallow deer, wild pig, and aurochs, and remains of small game are also present: fur animals, as well as animals available as additional meat supply, including pests (beaver, hare, badger, polecat, and fox).

The most important role in the economy was played by domestic animals, whose age structure indicates a strategy of exploitation primarily for meat consumption. The hunt also played an important role in the supply of meat and other useful materials obtainable from various wild animal species. Bird remains are rare. Fish remains, as well as tools made of bone and antler, primarily harpoons and hooks, show that fishing for large species was carried out. Alternative sources of food, including tortoises and clams, also had their place in the economy.

The faunal composition and general mode of animal exploitation are consistent with other sites of comparable age. However, differences are observable when frequency distribution of particular taxa are considered, especially high percentage of pig among domestic animals. Usage of additional supplies, expressed in the presence and probable consumption of clams and tortoises is another specific feature. The question is what these specific features reflect.

The answer is in a range of possibilities: that they are characteristic of the region, of the settlement as a whole, or just related to the excavated part of the settlement, and/or particular phase in the life of the settlement. The fact is that these particular features were not observed in the analyze of the faunal material from the same site in the previous excavation campaigns presented by Bökönyi[42]. Particularly striking is different distribution of domestic animals, which Bökönyi describes as preponderance of cattle, with sheep and goat at the second and pig at the third place. These differences in the composition of the archaeozoological material from different excavation campaigns, but same excavation area, and close stratigraphical position, indicate that it is more probable that horizontal distribution was the main factor of influence, depending on distribution of houses, pathways, workshops and various other activity areas. Differences may also be related to changes that affected Vinča society through time as it was developing and adopting to changing circumstances in the surrounding prehistoric world, even one or more shorter periods of crisis that could reflect on the site as a whole.

[42] Bökönyi 1990, p. 51, Abb.1.

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Резиме: ВЕСНА ДИМИТРИЈЕВИЋ, Филозофски факултет, Београд

ФАУНА КИЧМЕЊАКА СА ЛОКАЛИТЕТА ВИНЧА–БЕЛО БРДО (КАМПАЊЕ 1998–2003)

Истраживања на епонимном и најзначајнијем локалитету винчанске културе, Бело Брдо у селу Винча обновљена су 1998. године. Осим проучавања материјалне културе која се настављају на претходна истраживања, примене савремене методологије и новог система документовања ископавања, који треба да омогуће квалитативан помак у односу на претходна истраживања, нова истраживања имају за циљ и испитивање оних аспеката којима у ранијем периоду није посвећено довољно пажње. То се односи, пре свега, на економику праисторијских заједница и експлоатацију природних ресурса, у чијем ће дешифровању одлучујућу улогу имати археоботаничка и археозоолошка проучавања.

У овом раду приказани су фаунистички остаци сакупљени током кампања 1998–2003. године, до момента када је 2003.године промењена стратегија ископавања на локалитету. Фаунистички остаци, као и сав други археолошки материјал сакупљани су по по хоризонталној мрежи (квадрати 5 x 5 m и локуси 1 x 1 m), док се у току 2003.године није прешло се на систем контекстуално дефинисаних целина.

Материјал са флотације, која се врши почев од 2001. године, и треба да омогући, осим биљних, сакупљање остатака ситних кичмењака и бескичмењака, као и пропуштених фрагмента крупне фауне, овде неће бити презентован, јер није завршено његово издвајање из узорака.

Очуваност костију и зуба кичмењака је добра, углавном без трагова постдепозиционог физичко-хемијског распадања. Трагове распадања услед изложености атмосферским утицајима носи 7% примерака од укупно више од 20000 фрагмената сисарских костију. Трагови ватре уочени су на 6% од укупног броја примерака. Степен фрагментације је висок – мало је целих костију, док целих скелета нема.

Фаунистички остаци обухватају остатке сисара, птица, корњача, риба као и љуштуре мекушаца (табела 1).

По броју примерака и врста најважнији део фауне представљају остаци сисара. Таксономски састав сисарске фауне приказан је на табели 2. Дистрибуција појединачних таксона изражена је бројем идентификованих примерака, дијагностичких зона и минималним бројем индивидуа.

Остаци домаћих животиња незнатно су боље заступљени од дивљих (слика 1a). Међу домаћим животињама говече је најзаступљенија врста (слика 1c). Као и на другим налазиштима винчанске културе крупног је раста (табела 3). Међу доњим вилицама, преовлађују оне код којих није завршена смена млечних и сталних зуба, односно оне које припадају младим јединкама, а на основу дистрибуције димензија појединих делова скелета може се претпоставити да су женке бројније. Гајење је било усмерено на експлоатацију меса. За релативно велики број налаза говечета није одређена припадност дивљој или домаћој врсти, с обзиром на фрагментованост и присуство јединки које су по величини интермедијарне, и могу потицати било од женки дивљег или мужјака домаћег говечета (слика 3). Јасне разлике у величини у односу на домаћу форму постоје на малом броју примерака (слика 2).

Друга врста по бројности остатака међу домаћим животињама је свиња. Разликује се од дивље на основу изразито мањих димензија (табела 4, слике 4, 5 и 6). Ако ишта одступа од очекиваног у фауни Белог Брда, то је високо процентуално учешће свиње, и међу домаћим животињама, и када се посматра фауна у целини (слика 1c, d и e). На основу доњих вилица установљена је изразита доминација јувенилних животиња.

Овца и коза (табела 5) су мање заступљене од говечета и свиње. Само једна четвртина јединки доживела је зрелост. То показује, да је и у случају гајења оваца и коза, оно било усмерено на експлоатацију меса.

Остаци пса (табела 6, слике 7 и 8) чине 5,2% од од укупног броја идентификованих примерака. Стопа фрагментације разликује се од животиња које су гајене због меса, јер су повремено очуване и целе дуге кости. Заступљени су сви скелетни елементи, мада пропорционално мање доњи делови екстремитета. Морфолошке особине и величина скелета одговарају малим до средње крупним расама паса. Присуство паса у насељу, евидентно је не само на основу њихових остатака, већ и на основу трагова глодања, који су регистровани на 9% свих костију. На основу трагова касапљења на псећим костима може се закључити да је псеће месо било повремено конзумирано (слика 8).

Лов је имао значајно место у економији. Јелен је најбоље заступљена ловна врста (табела 7). Најбројни делови скелета су рогови и кости екстремитета, који такође представљају и најкоришћенију сировину за израду коштаних артефаката. Кости које носе месо су такође доста заступљене, а многи трагови филетирања показују да је месо јелена интензивно конзумирано. Присуство свих делова скелета показује да су животиње биле ловљене у близини и често доношене целе на локалитет. Неколико примерака хиодних костију са траговима сечења (слика 9) указују да је примарно касапљење било практиковано у самом насељу. Лов је био оријентисан према одраслим јединкама, а однос између мужјака и женки је 3 : 1.

Већ поменута дивља свиња је друга по заступљености ловна врста. Ловљене су претежно одрасле животиње. Лов на срну је такође био оријентисан ка одраслим животињама, и мужјацима (табела 8). Трећа врста јелена пронађена на Белом Брду је јелен лопатар, *Dama dama*. Откривено је фрагментовано стабло рога са оштећеним основама парожака за које се не може рећи да ли су поломљени или одсечени (слика 11), и још један изоловани парожак, који је био модификован у алатку. Чињеница да је су једино рогови пронађени може бити индикативна. Не треба искључити могућност да јелен лопатар није живео у околини насеља и није био ловљен од стране становника Винче, већ рогови набављени разменом са извесне раздаљине као егзотична роба.

Остале врсте дивљих животиња су глодари, зечеви (табела 9) и месождери (табела 10), од којих је већина ловљена највероватније због крзна, или као штеточине. Од дабра постоји само неколико примерака, док су остаци зеца чешћи. Мустелиди су разноврсни, али углавном представљени са свега неколико налаза. Од видре је пронађена само једна доња вилица. Откривена је само једна кост вука, док су остаци лисице нешто бројнији. Атрактивно крзно лисице било је један од разлога због кога је ловљена. Доња вилица приказана на слици 12 показује трагове драња коже. Од мрког медведа пронађене су једна лобањска и једна горњовилична кост. Веома истрошени зуби показују да се ради о врло старој животињи.

Рибе, птице, корњаче и шкољке представљали су додатне изворе хране.

Птице су врло ретко ловљене. Откривено је свега 55 костију птица током пет кампања ископавања. Остаци риба су много бројнији, а на значај риболова, осим рибљих костију указују нека оруђа прављена од кости и рога, пре свега харпуни и удице. На основу величине харпуна и удица, као и димензија различитих делова скелета риба може се закључити да је ловљена крупна риба, што не изненађује када се има у виду положај локалитета на обали Дунава.

Остаци корњача, скоро искључиво фрагменти оклопа, прилично су бројни. Стари преломи на већини фрагмената и трагови горења показују да су корњаче коришћене у исхрани, што искључује да остаци оклопа потичу од јединки које су се укопале у археолошки слој. На средини једног фрагмента оклопа корњаче пробушен је отвор (слика 13).

Љуштуре речних шкољака налажене су расуте по насељу, али и сконцентрисане у хрпама на неколико места, које су веома налик остацима хране. Посебно је питање да ли су коришћене у људској исхрани, исхрани животиња или у неку другу сврху, а нарочито да ли је употреба шкољака била уобичајена пракса током читавог трајања насеља или се везује само за одређена кратка раздобља.

Животињске кости и рогови коришћени су интензивно на Белом Брду за израду оруђа и украсних предмета. Рогови јелена представљали су омиљену сировину, нарочито за израду оруђа које је највећим делом коришћено у пољопривредним активностима. За израду коштаних алатки опет су кости јелена највише коришћене, нарочито метаподијалне кости, али су, као сировина, употребљаване и кости других врста – срне, говечета, овце и козе, ређе и пса. Најчешћи тип коштане алатке је шило.

	NISP	MNI
Mammalia (mammals)	20,710	137
Aves (birds)	55	/
Testudo sp. (tortoise)	337	14
Amphibia/Reptilia indet.	4	/
Pisces (fish)	995	/
Vertebrata indet.	15	/
Gastropoda (snails)	179	179
Bivalvia (bivalves)	469	377

*NISP and MNI are not comparable between different classes of vertebrates and invertebrates since criteria for counting specimens and MNI detemination differ.

Table 1. The distribution of various classes of animal remains recorded at Vinča–Belo Brdo in the 1998–2003 excavation campaigns

Табела 1. Заступљеност остатака различитих класа животиња сакупљених током ископавања 1998–2003 на локалитету Винча–Бело Брдо

species	NISP	DZ	MNI
Castor fiber (beaver)	6	3	1
Lepus europaeus (hare)	47	32	4
Mustela putorius (polecat)	3	3	2
Meles meles (badger)	2	2	1
Lutra lutra (otter)	3	3	1
Vulpes vulpes (fox)	22	8	3
Canis familiaris (dog)	144	89	9
Canis lupus (wolf)	1	1	1
Ursus arctos (brown bear)	2	0	1
Carnivora indet. (carnivores)	17	3	/
Sus scrofa (wild boar)	140	59	8
Sus domesticus (domestic pig)	270	141	13
Sus sp. (wild or domestic pig)	319	76	/
Cervus elaphus (red deer)	564	137	18
Capreolus capreolus (row deer)	155	75	7
Dama dama (fallow deer)	5	0	1
Cervidae indet. (deer)	7	0	/
Bos primigenius (aurochs)	8	6	3
Bos taurus (domestic cattle)	324	104	14
Bos sp. (wild or domestic cattle)	270	26	/
Ovis aries (sheep)	109	82	11
Capra hircus (goat)	15	12	5
Ovis/Capra (sheep or goat)	191	52	/
Ovis/Capra/Capreolus (small ruminant)	22	7	/
Bovidae indet. (bovid)	4	0	/
Ruminantia indet. (ruminant)	94	13	/
Artiodactyla indet. (artiodactyl)	13	0	/

NISP – number of identifiable specimens, DZ – diagnostic zone,
MNI – minimum number of individuals.

Table 2. Distribution of mammal species recorded in the 1998–2003 excavation campaigns

Табела 2. Заступљеност различитих врста сисара сакупљених током ископавања 1998–2003.

upper teeth		*B.t.*	*B.t.*
	L P	54.5	/
	LM	/	80.9

lower teeth		*B.t.*	*B.t.*
	LM	92.1	89.9

M3 inf.		*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	LM3	40.1	40.5	39.6	38.6	37.7	37.5	35.5	41.1
	BM3	14.1	13.4	15.3	17.0	16.7	13.9	13.2	/

scapula		*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	GLP	72.7	80.0	72.1	63.9	/	/	/	/	/	/
	LG	56.8	67.5	64.1	56.5	62.1	59.5	54.9	49.6	/	/
	BG	52.7	56.6	55.6	/	54.8	49.1	47.8	40.9	50.0	46.8
	SLC	55.7	/	/	/	/	/	/	/	/	/

pelvis		*B.t.*	*B.t.*	*B.t.*
	LAR	66.5	67.7	64.6

humerus		*B.t.*
	Bd	67.8
	Dd	60.9

radius		*B.p.*	sp.	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	Bp	/	94.9	/	/	/	/
	Dp	/	48.5	41.8	/	/	/
	Bd	109.2	/	/	72.9	69.2	68.6
	Dd	56.7	/	/	51.4	38.4	51.3

ulna		*B.t.*	*B.t.*
	DPA	62.2	60.7
	SDO	52.0	/
	BPc	/	48.0

tibia		*B.t.*	*B.t.*
	Bd	64.3	69.4
	Dd	43.6	51.2

astragalus		*B.t.*			
		n	min	max	x
	GLl	19	63.5	73.8	67.9
	Bd	19	38.3	46.8	42.9

calcaneus		*B.t.*	*B.t.*	*B.t.*
	GL	147.7	137.2	129.6
	APB	57.2	53.6	/
	GB	49.6	45.4	/

Mc prox.		*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	Bp	70.2	66.6	64.3	61.1	58.7	56.9	55.3	55.2	51.1
	Dp	40.0	43.8	38.7	37.3	34.7	33.6	33.1	33.3	36.6

Mc dist.		*B.p.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	Bd	82.4	68.8	62.0	61.3	61.0	60.5
	Dd	43.7	34.9	34.6	34.3	35.6	33.5

Mt prox.		*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	Bp	53.7	51.9	49.4	49.1	45.3	54.8	42.4
	Dp	53.5	52.0	47.8	47.7	43.8	/	/

Mt dist.		*B.p.*	*B.p.*	sp.	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	Bd	73.6	69.5	65.5	60.8	59.4	57.4	57.2	56.5	54.5	54.3
	Dd	41.6	38.3	35.4	34.2	35.7	33.6	34.4	32.1	32.0	30.6

Ph I		*B.p.*	*B.p.*	*B.t.*			
				n	min	max	x
	Glpe	78.6	71.3	26	57.1	65.4	61.6
	Bd	31.2	32.6	25	25.0	37.2	30.1

Ph II		*B.p.*	*B.t.*			
			n	min	max	x
	Glpe	49.1	38	35.8	45.4	40.3
	Bd	35.3	39	21.9	32.9	25.4

Ph III		*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*	*B.t.*
	Ls	73.8	64.6	/	71.4	72.5	/	66.9	/	60.2
	Bs	30.2	23.3	28.9	24.1	24.6	27.9	22.1	24.9	19.6

LP=length premolar row; LM=length molar row; LM3=length third molar; BM3=breadth third molar.
Other measurement abbreviations like in von den Driesch, 1976.

Table 3. Domestic (B.t.) and wild (B.p.) cattle bone measurements

Табела 3. Димензије различитих делова скелета домаћеī (B.t.) и дивљеī (B.p.) говечета

		S.s.	*S.s.*	*S.s.*	*S.s.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
upper teeth	LP	54.1	/	/	/	42.7	42.5	41.8	/	/	/	/	/	/
	LM	/	78.3	/	/	/	/	/	60.4	57.8	61.3	/	/	/
	LM3	/	38.4	36.6	38.7	/	/	/	28.1	26.2	27.5	29.7	28.8	29.6
	BM3	/	20.5	20.8	23.4	/	/	/	16.6	15.7	16.5	17.0	17.5	17.9

		S.s.	*S.s.*	*S.s.*	*S.s.*	*S.s.*	*S.s.*	*S.s.*	*S.s.*	*S.d.*	*S.d.*	*S.d.*
lower teeth	LPM	132.8	129.7	/	/	/	/	/	/	/	/	/
	LP	44.2	43.3	/	/	/	/	/	/	35.9	/	/
	LM	90.2	86.3	79.2	75.3	63.6	/	/	/	/	/	/
	LM3	47.1	46.2	41.2	40.9	41.4	42.6	42.0	39.0	/	28.6	27.9
	BM3	19.0	19.0	19.7	19.1	18.5	19.4	17.9	21.6	/	13.7	13.9

		S.s.	*S.d.*	*S.d.*	*S.d.*
atlas	GL	/	36.9	/	/
	BFcr	70.3	42.6	50.2	45.5
	H	58.4	37.9	39.0	38.0

		S.d.
epistropheus	LCDe	30.9
	Bfcr	40.9
	BPtr	28.2

		S.s.	*S.s.*	*S.s.*	*S.s.*	*S.s.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
scapula	GLP	46.2	44.7	42.2	39.1	/	30.4	/	/	/	/	/	/	/
	LG	39.0	36.4	32.8	39.0	/	24.4	/	/	/	/	/	/	/
	BG	31.6	31.7	/	36.6	30.5	20.3	/	/	/	/	/	/	/
	SLC	32.8	/	30.9	34.8	30.2	/	18.6	18.1	18.5	16.6	19.8	17.9	18.6

		S.s.	*S.d.*	*S.d.*	*S.d.*
pelvis	LA	45.8	32.3	30.8	/
	LAR	39.5	27.2	27.6	25.8

		S.s.	*S.s.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
humerus	Bd	50.5	48.4	35.0	34.1	33.2	32.7	32.5
	Dd	52.6	43.2	30.8	34.1	33.7	33.4	31.7

		S.s.	*S.s.*	*S.s.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
radius	Bp	39.6	37.8	31.9	25.5	25.4	25.1	24.7	24.6	24.5	24.5	23.6	22.8
	Dp	/	27.1	27.7	18.6	17.5	17.1	17.5	16.9	17.9	16.8	16.8	15.8

		S.d.	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
ulna	DPA	32.1	31.5	31.0	30.9	29.3	28.2	23.8
	SDO	23.8	/	22.4	/	/	22.2	/
	BPc	20.3	17.5	16.9	17.9	17.3	17.3	15.3

		S.s.	*S.s.*	*S.s.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
tibia	Bp	/	/	/	36.7	/	/	/	/	/
	Bd	41.2	37.6	35.1	/	27.1	25.8	25.3	24.9	24.2
	Dd	35.4	33.3	32.9	/	23.6	22.2	20.1	21.6	20.3

		S.s.	*S.s.*	*S.s.*	*S.s.*	*S.s.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*	*S.d.*
astragalus	L	54.2	53.3	52.3	51.2	49.2	37.8	36.4	36.1	35.9	34.6	34.5	33.2
	Bd	32.6	29.9	30.5	28.1	28.5	19.5	20.0	19.8	19.4	19.1	17.7	18.5

		S.s.	*S.s.*	*S.s.*	*S.d.*	*S.d.*
calcaneus	L	104.7	103.8	101.1	63.3	/
	APB	40.2	40.2	38.1	24.6	25.8
	Dcal	28.4	31.1	29.1	29.3	20.7

		S.s.	*S.s.*	*S.s.*	*S.s.*	*S.d.*
Mc III	GL	106.5	100.2	92.3	91.7	65.7
	Bd	23.6	23.3	20.5	22.6	13.8

		S.s.	*S.s.*	*S.s.*
Mc IV	GL	102.9	101.3	96.7
	Bd	23.5	22.5	23.7

		S.s.	*S.d.*
Mc V	GL	65.7	45.1
	Bd	13.6	9.5

		S.s.	*S.d.*	*S.d.*
Mt III	GL	112.4	70.6	68.3
	Bd	25.1	12.2	8.9

		S.s.
Mt IV	GL	116.0
	Bd	24.1

LPM=length premolar-molar row; LP=length premolar row; LM=length molar row; LM3=length third molar; BM3=breadth third molar. Other measurement abbreviations like in von den Driesch, 1976.

Table 4. Domestic (S.d.) and wild (S.s.) pig bone measurements

Табела 4. Димензије различитих делова скелета домаће (S.d.) и дивље (S.s.) свиње

upper teeth		O/C	O/C	O/C	O/C	O/C
	LP	20.9	/	/	/	/

		O.a.	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*C.h.*	*C.h.*	O/C	O/C
lower teeth	LPM	65.7	66.3	63.6	66.9	67.6	/	70.3	68.3	/	/
	LP	20.5	22.1	20.6	20.9	20.6	22.2	21.9	21.0	24.1	26.6
	LM	45.4	44.8	42.8	46.3	41.1	/	48.3	45.3	/	/

	O.a.	
atlas	BFcr	40.6
	H	34.4

		O.a.	*O.a.*	*O.a.*
scapula	GLP	26.6	28.2	26.9
	LG	22.4	21.6	/
	BG	15.1	17.0	16.4
	SLC	/	15.5	/

		O.a.	*O.a.*	O/C	O/C	O/C
pelvis	LAR	24.9	23.4	25.7	22.7	23.5

	O.a.	*O.a.*	*O.a.*	O/C	O/C
humerus Bd	26.1	25.0	24.7	26.0	24.5
Dd	21.1	21.6	21.4	/	/

	O.a.	*C.h.*	*C.h.*	
radius GL		121.4	/	
Bp	24.5	26.5	/	
Dp	12.8	13.3	/	
Bd	/	24.1	24.1	
Dd	/	16.0	16.5	

		O/C	O/C	O/C	O/C
ulna	DPA	23.3	23.5	/	/
	SDO	19.8	/	/	/
	BPc	16.8	13.7	17.2	14.7

		O.a.	*O.a.*	*O.a.*	*O.a.*	*C.h.*	O/C	O/C
tibia	Bd	24.1	22.6	22.2	21.9	25.4	20.9	20.2
	Dd	19.0	18.1	17.4	17.6	18.7	15.9	15.0

		O.a.	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*C.h.*	O/C	O/C
astragalus	GLl	25.3	25.1	24.6	24.0	23.6	23.6	23.2	23.1	23.0	23.0	21.5	29.0	24.4	24.4
	Bd	16.5	15.2	16.4	15.7	15.7	15.3	15.8	14.9	15.3	14.3	13.6	18.5	15.9	14.7

	O.a.	
calcaneus GL	46.2	
APB	18.7	
DB	15.9	

		O.a.	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*	*O.a.*
Mc	GL	114.6	112.5	110.3	97.9	/	/	/	/	/
	Bp	20.1	19.8	19.9	17.9	20.1	19.2	18.6	18.2	18.0
	Dp	13.8	14.4	14.9	13.1	14.8	14.3	14.2	13.9	13.5
	Bd	23.1	22.0	23.7	20.9	/	/	/	/	/
	Dd	14.2	14.8	14.7	13.0	/	/	/	/	/

		O.a.	*O.a.*	*O.a.*	*O.a.*	*C.h.*	O/C
Mt	GL	117.1	107.8	/	/	/	/
	Bp	17.7	17.3	17.7	16.8	22.9	19.4
	Dp	18.5	/	18.1	/	22.1	18.8
	Bd	20.5	20.6	/	/	/	/
	Dd	13.8	13.9	/	/	/	/

		O.a.	O/C	O/C	O/C	O/C	O/C	O/C	O/C	O/C	O/C	O/C
Ph I	Glpe	32.8	41.1	36.2	35.4	31.9	31.4	31.2	29.7	28.6	28.4	25.6
	Bp	11.2	12.7	11.4	/	10.5	9.9	10.6	10.8	9.8	9.1	10.9
	Bd	9.9	11.3	9.7	11.0	10.4	9.0	9.6	/	9.0	/	/

		O/C	O/C	O/C	O/C
Ph II	Glpe	22.4	20.7	19.3	17.5
	Bp	8.8	9.9	9.6	10.2
	Bd	6.3	8.2	7.8	8.6

		O.a.	*O.a.*	*O.a.*	*O.a.*	O/C
Ph III	Ls	26.9	23.7	25.7	25.5	22.4
	Bs	9.0	6.3	/	/	/

LPM=length premolar-molar row; LP=length premolar row; LM=length molar row;
APB=calcaneus antero-posterior breadth, measured perpendicular to GB.
Other measurement abbreviations like in von den Driesch, 1976.

Table 5. Sheep (O.a.) and goat (C.h.) bone measurements

Табела 5. Димензије различитих делова скелета овце (O.a.) и козе (C.h.)

cranium	Lcdbl	164.6	/	/	/	/	/
	BC	34.7	35.2	/	/	/	/
	BM	57.4	58.2	/	/	/	/
	LIM	90.5	93.1	85.6	/	/	/
	LCM	75.1	75.6	71.8	/	/	/
	LPM	61.6	63.6	52.1	56.2	59.6	/
	LP	47.8	49.5	43.2	42.4	42.2	/
	LM	17.4	16.3	15.1	16.2	/	18.9

mandible	L	125.2	105.7	/	/	/	/	/	/	/	/	/	/
	Hcor	42.9	43.9	51.1	50.6	49.4	43.7	42.4	/	/	/	/	/
	H(M1)	20.2	17.7	18.6	18.2	19.4	18.1	17.4	23.1	19.3	18.8	/	/
	B(M1)	11.3	9.1	11.7	10.3	11.6	8.8	10.6	11.8	10.6	10.6	/	/
	LIM	90.3	78.9	/	/	/	/	/	/	/	/	92.7	
	LCM	83.2	75.0	/	80.3	/	/	/	/	/	/	85.2	75.9
	LPM	68.4	/	/	69.1	70.4	61.5	63.5	73.4	67.4	/	70.5	61.7
	LP	36.1	32.7	/	36.0	36.9	33.2	33.2	40.4	34.8	35.1	38.0	35.3
	LM	32.4	30.2	34.2	33.8	35.0	30.2	32.8	34.8	32.9	/	34.7	33.5
	LM1	21.1	21.1	20.9	20.7	20.7	20.5	20.4	20.0	18.3	17.4		
	BM1	7.9	7.7	8.5	8.5	7.6	7.9	8.4	8.2	6.7	6.9		

atlas	GL	33.1	35.2	31.0	29.6	/	/	/
	GB	67.0	/	62.4	64.8	/	/	/
	Bfcr	35.3	33.4	/	32.1	35.6	33.0	31.8
	H	23.1	23.1	22.2	22.2	22.7	21.9	22.7

axis	LCDe	47.1	43.5	/
	Bfcr	31.0	27.7	25.9
	BPtr	/	35.7	31.0
	SBV	23.7	20.2	18.1

scapula	GL	122.2	/	/
	GLP	26.3	27.5	22.8
	LG	23.4	24.5	21.1
	BG	15.9	16.8	19.4
	SLC	23.6	21.7	19.2

pelvis	LAR	22.5	22.2	21.1	20.7	20.3			

humerus	GL	129.9	/	/	/	/	/	/	/	/
	Bp	/	26.2	/	/	/	/	/	/	/
	Dp	/	32.2	/	/	/	/	/	/	/
	Bd	23.9	/	27.8	27.5	26.7	26.0	25.8	22.8	27.7
	Dd	19.5	/	21.7	22.2	21.9	21.0	20.7	17.5	/

ulna	GL	141.2	/	/	/	/	**radius**	GL	151.7	/	/	/
	DPA	19.3	19.9	20.4	20.3	19.8		Bp	15.6	16.7	14.2	14.0
	SDO	16.0	16.3	/	/	/		Dp	11.0	11.3	8.3	9.5
	BPc	13.3	13.6	13.4	13.3	11.6						

femur	Bp	34.8	30.2	/	**tibia**	Bp	29.4	/
	Dp	16.5	14.5	/		Dp	33.3	/
	Bd	/	/	27.6		Bd	/	20.1
						Dd	/	14.8

Mc II	GL	59.7	53.5	52.0	**Mc IV**	GL	59.1	50.5	**Mc V**	GL	43.9
	Bd	7.6	7.5	7.7		Bd	7.3	7.1		Bd	8.1

Mt II	GL	55.6
	Bd	7.7

Lcdbl=condylobasal length; BC=palatal breadth across the outer borders of the canine alveoli;
BM=greatest palatal breadth across the outer borders of the molars alveoli; LIM=length first incisor-last molar;
LC=length canine-last molar; LPM=length premolar-molar row; LP=length premolar row; LM=length molar row;
LM1=length first molar; BM1=breadth first molar. Other measurement abbreviations like in von den Driesch, 1976.

Table 6. Dog bone measurements

Табела 6. Димензије различитих делова скелета пса

antler	D p	31.2												
	D b	49.2												
upper teeth	LP	53.9	45.3	/	/	/	/							
	LM	/	/	77.0	75.3	73.4	/							
lower teeth	LP	55.9	52.8	52.7	52.4	51.7	50.0	48.1	/	/	/	/	/	/	/
	LM	/	/	/	/	/	/	/	85.3	80.4	/	/	/	/	/
	LM3	/	/	/	/	/	/	/	/	33.6	32.4	32.1	31.6	30.6	/
	BM3	/	/	/	/	/	/	/	/	15.3	15.1	13.6	14.4	13.9	/
axis	Bfcr	70.6													
scapula	GLP	69.4	61.7	/	/										
	LG	52.4	46.8	47.6	/										
	BG	50.2	/	42.9	/										
	SLC	/	39.5	38.8	35.3										
pelvis	LAR	59.8	53.4	51.7											
humerus	Bd	62.7													
	Dd	57.1													
ulna	DPA	51.1	43.5	/											
	BPc	31.7	31.7	30.4											
radius	Bp	63.6	62.8	57.6	/										
	Dp	34.1	32.5	31.6	/										
	Bd	/	/	/	57.8										
	Dd	/	/	/	42.7										
tibia	Bd	61.0	58.5	55.3	54.8	54.0	51.7	51.6							
	Dd	49.3	42.1	44.4	42.3	42.2	46.2	38.1							

	n	min	max	x
astragalus GLl	21.0	56.5	66.0	60.8
Bd	21.0	34.8	41.7	38.2

calcaneus GL	131.4	128.9	122.3	118.3	/	/	/	/	/	/	/
APB	49.1	50.5	43.8	43.5	47.7	46.4	47.0	44.5	44.3	43.8	/
GB	41.0	43.3	35.2	33.3	38.5	39.3	38.0	35.2	36.7	36.5	41.6

Mc Bp	48.7	48.7	47.2	43.2	/	/	/	/
Dp	34.6	35.8	/	31.1	35.2	/	/	/
Bd	/	/	/	/	/	50.5	45.5	45.2
Dd	/	/	/	/	/	33.3	30.4	30.5

Mt Bp	47.2	44.5	42.6	40.0	39.0	37.3	/	/	/	/	/	/	/
Dp	47.1	/	44.9	44.1	45.0	42.2	/	/	/	/	/	/	/
Bd	/	/	/	/	/	/	54.2	46.6	46.1	45.3	45.1	44.8	/
Dd	/	/	/	/	/	/	34.7	30.1	29.9	29.6	29.4	29.3	34.0

	n	min	max	x
Ph I Glpe	42	54.9	67.3	61.5
Bp	38	20.6	26.1	23.8
Bd	45	19.3	24.8	22.2

	n	min	max	x
Ph II Glpe	40.0	40.2	50.5	45.4
Bp	43.0	19.3	25.5	22.3
Bd	40.0	16.5	22.9	19.6

	n	min	max	x
Ph III Ls	10	45.4	57.3	53.1
Bs	10	12.5	21.6	16.3

Dp=Pedicle greatest diameter; Db=burr greatest diameter; LP=length premolar row; LM=length molar row; LM3=length third molar; BM3=breadth third molar; APB=calcaneus antero-posterior breadth, measured perpendicular to GB. Other measurement abbreviations like in von den Driesch, 1976.

Table 7. Red deer bone mesurements

Табела 7. Димензије различитих делова скелета јелена

lower teeth	LPM	65.6	66.5	65.1	/	/	/	/	/	/	/
	LP	27.2	27.0	27.4	30.8	26.8	26.6	/	/	/	/
	LM	39.3	38.0	39.6	/	/	/	/	/	/	/
	LM3	/	/	15.5	/	/	/	16.5	15.6	15.5	16.1
	BM3	/	/	7.6	/	/	/	8.4	8.2	7.6	7.9

epistropheus	LCDe	61.9

scapula	GLP	30.6	29.7	27.7	28.1	/	**pelvis**	LAR	30.6	28.2
	LG	23.8	22.1	22.4	20.5	/				
	BG	23.5	23.3	20.7	/	/				
	SLC	19.3	/	/	18.5	19.1				

humerus	Bd	30.2
	Dd	22.3

radius	Bp	29.6	29.5	29.4	29.2	28.0	27.2	26.9	25.9	/
	Dp	17.5	17.2	17.2	16.4	15.8	/	16.1	15.7	/
	Bd	/	/	/	/	/	/	/	/	27.2
	Dd	/	/	/	/	/	/	/	/	19.4

ulna	DPA	24.6
	SDO	21.7
	BPc	13.7

tibia	Bp	36.9	/	/	/	/	/	/
	Bd	/	30.3	29.7	29.6	28.6	22.9	21.6
	Dd	/	23.2	23.5	23.9	23.9	17.6	17.2

astragalus	GLl	32.4	31.3	30.9	30.8	30.4	29.8	**calcaneus**	GL	68.1	/
	Bd	/	19.9	19.4	18.6	19.9	18.5		APB	27.0	26.9
									GB	21.3	20.7

Mc	Bp	24.1	23.1	22.9	22.8	22.5	21.8	/	/	/
	Dp	18.0	17.0	17.0	17.1	16.9	15.6	/	/	/
	Bd	/	/	/	/	/	/	24.2	23.6	23.3
	Dd	/	/	/	/	/	/	15.9	15.2	15.9

Mt	GL	202.2	/	/	/	/	/	/	/	/	/
	Bp	22.6	22.5	22.1	21.7	20.8	/	/	/	/	/
	Dp	22.8	23.5	23.4	22.5	21.6	/	/	/	/	/
	Bd	27.5	/	/	/	/	26.3	25.7	25.0	24.6	24.6
	Dd	17.2	/	/	/	/	17.2	17.6	16.6	16.9	16.3

Ph I	Glpe	43.6	43.0	41.6	40.6	40.0	36.9	35.7	35.6
	Bp	13.3	12.8	13.2	12.3	12.5	10.9	10.9	11.6
	Bd	12.0	10.8	11.3	10.7	10.2	9.4	9.8	9.2

Ph I	Glpe	30.7	30.5	30.3	30.0	25.0	24.2	24.1	22.9	**Ph III**	Ls	25.7	24.9
	Bp	/	10.9	10.6	10.2	10.1	9.5	9.2	9.8		Bs	6.8	5.7
	Bd	9.3	7.7	7.6	7.6	7.2	7.2	6.4	6.4				

LM=length molar row; LPM=length premolar-molar row; LP=length premolar row; LM=length molar row; LM3=length third molar; BM3=breadth third molar; APB=calcaneus antero-posterior breadth, measured perpendicular to GB. Other measurement abbreviations like in von den Driesch, 1976.

Table 8. Roe deer bone measurements

Табела 8. Димензије различитих делова скелета срне

Castor fiber

mandible		
	Hcor	37.8
	LM	24.8

pelvis		
	LAR	14.5

humerus		
	Bd	34.6
	Dd	11.5

Lepus europaeus

mandible		
	H(M1)	15.4
	B(M1)	6.0
	LPM	16.9

axis				
	LCDe	39.9	/	/
	Bfcr	24.9	25.3	25.8
	SBV	18.7	20.1	/

scapula		
	GLP	15.7
	SLC	8.0

pelvis				
	LAR	13.9	13.2	13.0

humerus			
	Bd	13.4	13.0
	Dd	10.2	9.5

radius								
	Bp	10.5	10.3	9.7	9.4	8.6	/	/
	Dp	7.1	6.6	6.4	/	5.7	/	/
	Bd	/	/	/	/	/	11.7	11.7
	Dd	/	/	/	/	/	7.2	7.1

ulna				
	DPA	12.8	/	/
	SDO	12.9	/	/
	BPc	10.3	9.1	9.0

tibia			
	Bd	16.6	15.0
	Dd	10.3	9.8

astragalus			
	GL	18.4	16.5
	GB	8.5	8.0

calcaneus		
	GL	36.2
	APB	13.2
	GB	11.8

Mc II		
	GL	35.0
	Bd	5.3

Mc III				
	GL	39.8	38.2	36.6
	Bd	4.7	5.4	4.7

Mc IV		
	GL	31.4
	Bd	5.4

Mt IV			
	GL	64.7	60.0
	Bd	6.4	6.3

Mt IV			
	GL	58.1	53.8
	Bd	6.3	6.1

Hcor=height vertical ramus; LM=length molar row; H(M1)=height in front M1 anterior alveole; B(M1)=breadth in front M1 anterior alveole; LPM=length premolar-molar row; APB=calcaneus antero-posterior breadth, measured perpendicular to GB. Other measurement abbreviations like in von den Driesch, 1976.

Table 9. Beaver and hare bone measurements

Табела 9. Димензије различитих делова скелета дабра и зеца

Canis lupus	**calcaneus**	GB	25.4	
Vulpes vulpes	**mandible**	Hcor	34.0	/
		H(M1)	13.2	15.7
		B(M1)	6.9	8.4
		LPM	/	58.1
		LP	/	30.5
		LM	/	29.1
	radius	Bp	13.3	13.2
		Dp	8.9	9.3
	tibia	Bd	17.8	
		Dd	13.2	
	Mc II	GL	37.6	32.8
		Bd	5.8	5.2
	Mc III	GL	52.8	
		Bd	7.2	
	Mc IV	GL	52.2	
		Bd	7.0	
	Mc V	GL	39.0	
		Bd	6.7	
	Mt II	GL	45.9	/
		Bd	6.8	/
Meles meles	**mandible**	Hcor	32.2	/
		H(M1)	12.2	12.6
		B(M1)	6.2	6.7
		LPM	38.9	38.3
		LP	19.2	17.0
		LM	19.8	22.1
		LM1	14.8	15.7
		BM1	7.0	7.3
Mustela putorius	**mandible**	Hcor	/	21.1
		H(M1)	7.0	/
		B(M1)	3.6	4.7
		LPM	16.9	/
		LP	7.6	/
		LM	9.4	/
		LM1	7.5	8.3
		BM1	/	3.3
Lutra lutra	**mandible**	B(M1)	7.2	
		LM	18.9	
		LM1	13.4	
		BM1	6.8	
	tibia	Bd	17.2	
		Dd	13.4	
Ursus arctos	**maxilla**	LM2	32.0	
		BM2	17.3	

Hcor=height vertical ramus; H(M1)=height in front M1 anterior alveole;
B(M1)=breadth in front M1 anterior alveole; LPM=length premolar-molar row; LP=length premolar row;
LM=length molar row; LM1=length first molar; BM1=breadth first molar; LM2=length second molar;
BM2=breadth second molar. Other measurement abbreviations like in von den Driesch, 1976.

Table 10. Wild carnivores bone measurements

Табела 10. Димензије различитих делова скелета дивљих месождера