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The Lepenski Vir Fauna: Bones in Houses and Between Houses

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ABSTRACT - *Besides its monumental stone sculpture and peculiar architecture, and its dubious position between the Mesolithic and Neolithic, Lepenski Vir culture is claimed as one of the first in Europe in which dog domestication occurred. There are notes of other domestic species' bones found in a context originally interpreted as belonging to a fisher-hunter-gatherer society. It is presumable that a subsistence strategy itself, related primarily to animal exploitation, be it of tame or wild, mammalian or non-mammalian species, inspired the foundation of settlements on the Danube's banks in the Iron Gates. In this regard, the first results of previously un-analysed osteological material from the locality are presented. The material originates from the Lepenski Vir excavation campaigns of 1968–1970, from the floors of houses, beneath them, and from the spaces extending between houses.*

IZVLEČEK - *Kultura Lepenskega Vira je znana po svojih monumentalnih kamnitih plastikah, nenavadni arhitekturi in nejasni umeščenosti med mezolitik in neolitik. Razen tega naj bi bila ta kultura ena od prvih v Evropi, kjer so udomačili psa. Obstajajo tudi zapisi o kosteh drugih udomačenih vrst, ki so jih prvotno interpretirali kot da pripadajo ribiško-lovsko-nabiralni skupnosti. Domnevamo, da je prav način preživljanja, povezan pretežno z izkoriščanjem živali – bodisi divjih ali udomačenih, sesalcev ali drugih vrst, vplival na ustanovitev naselbin na bregovih Donave v Železnih vratih. V tem članku predstavljamo prve rezultate dosedaj še neanaliziranega osteološkega materiala z najdišča Lepenski Vir, izkopanega med leti 1968 in 1970. Material izvira s hišnih tal, plasti pod njimi in iz prostora med hišami.*

KEY WORDS - *Lepenski Vir; faunal remains; Mesolithic; Neolithic; Neolithisation*

INTRODUCTION

The faunal remains to be described in this paper originate from material collected in the course of the 1968–1970 excavation campaigns at Lepenski Vir. Excavations at the site of Lepenski Vir were rescue excavations, as part of an intensive archaeological research into the Iron Gates region that was initiated by the construction of the dam near Kladovo. They began in 1965, as small-scale excavation, and with rather modest expectations (*Srejović 1966*), but soon revealed a settlement with a new kind of architecture, and monumental stone sculptures, providing the foundations for the establishment of a new archaeological culture (*Srejović 1966a*). The excavation area was enlarged to incorporate the whole area of the settlement, and work continued until 1970, when the houses of Lepenski Vir were relocated to a site above the rising water level (*Čanak-Medić 1970*). Constant pressure imposed by a time limit, due to the construction of the dam, determined the excavation strategy, and the collecting of animal remains certainly could not have been the priority. Consequently, a rather small sample of animal bones was collected. Animal remains from the earlier excavation campaigns have been analysed and published in the form of a preliminary report (*Bökönyi 1969*). The sample consisted of 2999 identified specimens, of which only 630 were from Lepenski Vir I and II, with the balance deriving from Lepenski Vir III phases. A selection of this sample, as well as animal remains collected in succeeding campaigns, are stored in the National Museum in Belgrade. It was through the kind-

ness of Ljubinka Babović, a curator at the National Museum, that I learned of this material, and she entrusted me with analysing it, for which I am sincerely grateful.

Animal bones stored in the National Museum in Belgrade are packed in bags, with labels designating their origin. The better part of the material originates from the spaces related to the houses, and usually only the number of the house is marked, or whether bones come from beneath the house floor. For the material occurring outside the architectural features, a digging layer is specified, and a square. Since the squares are 4x4 m, and digging layers are not easy to correlate with the building horizons, the position of bones occurring outside the houses is not very precise.

The state of preservation of the bones is very good. There are fragile skeleton parts, bones in articulation, and bones from neonate animals, all indicating that physico-chemical agencies and soil quality did not alter the quantity of bones to a great extent, if at all. We can conclude that the fragmentation of bones is due to predepositional factors, while the amount of bones collected is determined by the excavators' decisions. These were strongly selective, therefore creating a biased sample. Hand collecting resulted in the under-representation of small animals and a small parts of large animal skeletons; furthermore, the vertical and horizontal distribution of faunal components cannot be reconstructed, and the collecting of bones belonging to particular units does not mean that all the bones related to particular features or indicated spaces were actually collected. In this respect, I have decided to present particular units that offer most promise of enlightening particular spots in the settlement area at Lepenski Vir, and enable the reconstruction of particular patterns of man/animal relations. Among the units presented, two are related to houses: house 40, at the eastern end of the settlement, and house 28, at the western end, while the two units derive from the area below the floors of houses 47' and 31, and were in fact, related to the spaces stretching between the houses (Fig. 1). The remains of the following species have been analysed: wild swine, (*Sus scrofa* Linnaeus) from the floor of house 40; red deer (*Cervus elaphus* Linnaeus) from the floor of house 28, and from the area below the floors of

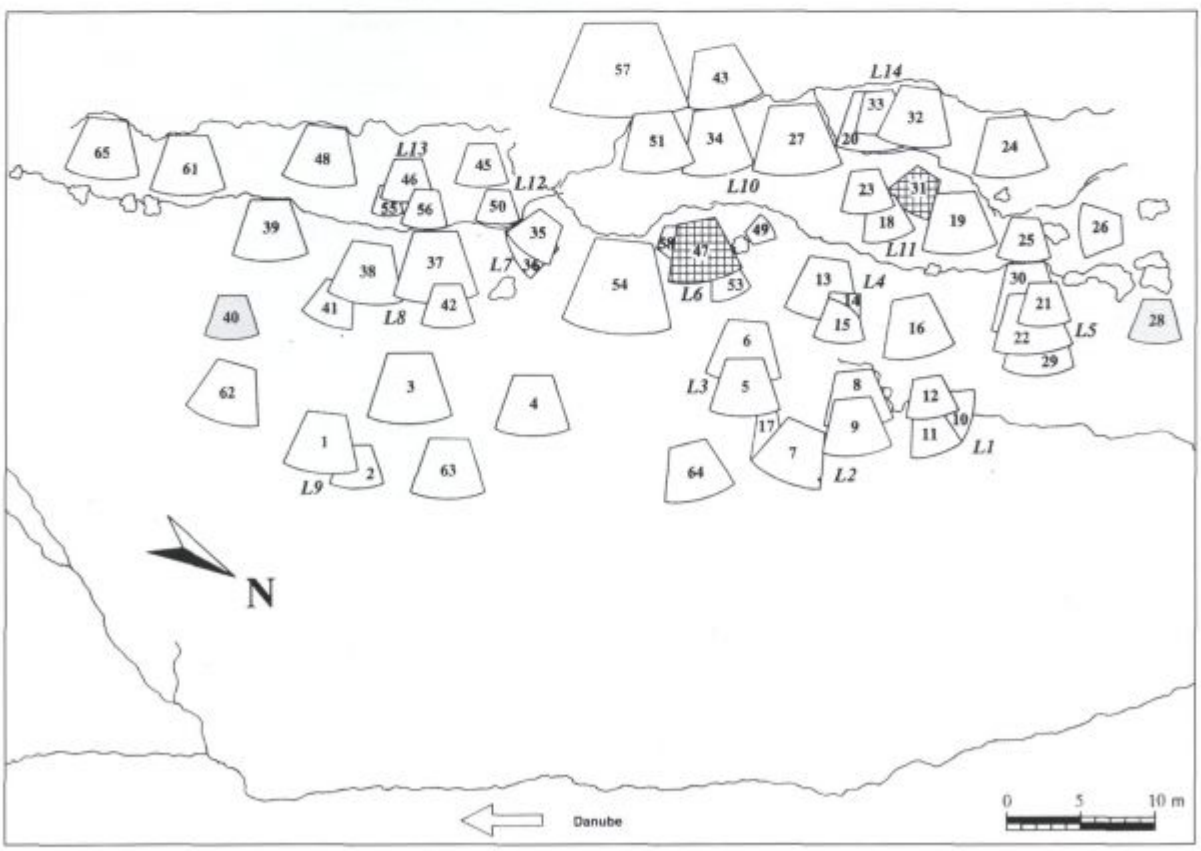

Fig. 1. Lepenski Vir I plan of settlement (*after Radovanović 1996*). The position of houses 40 and 28, where the bones described in this paper are found on the house floors is marked by shading, and position of houses 47 and 31 where the bones are found below the house floors is covered by mosaic pattern.

houses 47' and 31; brown bear, (*Ursus arctos* Linnaeus) below the floors of houses 47' and 31; beaver, (*Castor fiber* Linnaeus), roe deer, (*Capreolus capreolus* Linnaeus), and a large species of deer, *Cervidae indet*, from the area below the floor of house 47'.

The wild boar carcass in house 40

House 40 (Fig. 2) is a non-superimposed house found at the downstream end of the settlement. It is interpreted as belonging to Lepenski Vir I, Phase Ic (*Srejović 1969.71, Fig. 15*), i.e. Lepenski Vir I, phase I (*Radovanović 1996.176*). A sculpture was found on the floor in the rear part of this house, and a grave (grave 61) beneath the floor, with its head just below the sculpture. There was an altar above the fireplace, and behind it, an adult female mandible ("grave 21") with a stone plaque within it. Another grave was interred behind the left frontal corner of the house (grave 60). None of the graves was noted to contain grave goods (*Radovanović 1996.176*).

Animal bones were found on the house floor, along its longer right wall (B–C (*after Srejović 1969*), as it was labelled during the excavation), mostly of wild boar. As indicated in the subtitle, these are not just fragments showing the presence of the species, but complete or better parts of bones, indicating the deposition of a large section of carcass within the house at the time when its use was suspended (Figs. 3, 4). This could have been either suddenly and unwillingly, or as a prepared departure, with the intention of permanent or temporary abandonment. The following questions could bring us closer to understanding the house abandonment event: whether the bones were stripped of meat in the process of food preparation, and in such a way left behind in the house, or carcass parts were left, either as fresh meat, or dried; whether these remains belonged to a single animal or several different animals; what body parts were present, i.e. exactly what amount of carcass.

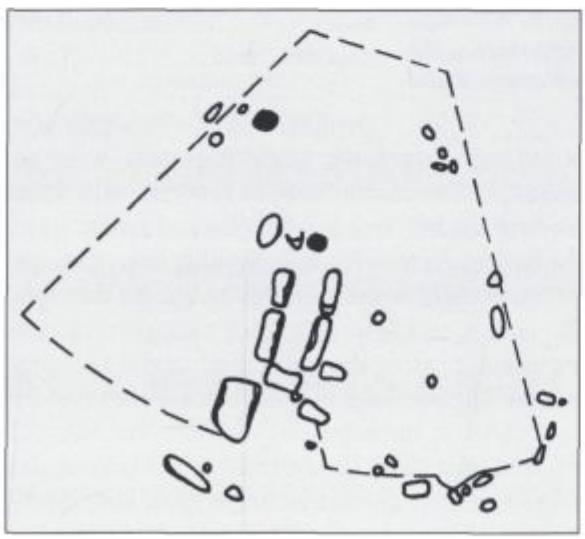

Fig. 2. House 40, Lepenski Vir I (after Srejović and Babović 1983).

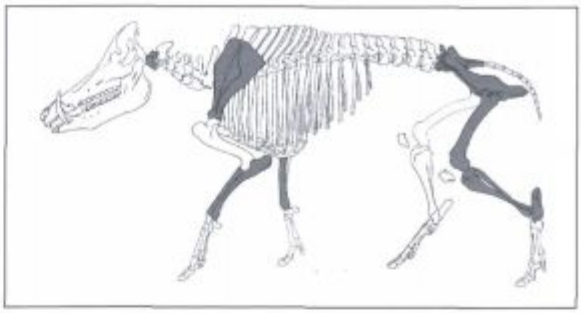

Fig. 3. Wild boar skeleton with bones found in house 40 shaded.

The insight into the skeleton parts' distribution shows that those parts that have most meat are present: the sacral part of the backbone and the final lumbar vertebra, a fragment of atlas, parts of shoulder and pelvic girdles, and mostly the upper parts of fore and hind legs (Fig. 4). Since none of the skeleton elements were found represented by more then a single specimen, the assumption is appearing that we are dealing with the remains of a single animal. To confirm this, we should find all the skeletal elements showing the same age, and fitting by their size.

Regarding the first question, we can notice that the epiphyseal lines are fused in all the bones except one, the thigh bone, in which the epiphyseal line of distal articulation is clearly observable along its whole length (Figs. 4.2a,b). Although thighbone distal articulation fuses late in ontogenetic development, this is also true for the articulations of proximal and distal ulna and distal radius (*Habermehl 1975; Bull and Payne 1982*). These are completely fused in the ulna and radius from house 40 (Figs. 4.4, 4.5), thus indicating older individual age. It is possible, and even probable, that the thighbone did not belong to the same animal as the other bones. Another consideration in establishing whether all the bones belonged to a single animal is their size (Tab. 1).

Measurements after Driesch, 1976, except depths of radius proximal and distal end, and tibia distal end, which are perpendicular to their breadths; the

Fig. 4. Sus srofa scrofa, house 40: 1. sacrum, last lumbar vertebra and fragments of right and left pelvis; 2. femur sin. dist., a. cranial, b. medial view; 3. scapula sin.; 4. radius prox. dext.; 5. ulna and radius sin.; 6. left astragalus, calcaneus and distal fibula in articulation, a. dorsal, b. plantar view; 7. a. same bones, the arrow points to the breakage of fibula, b. fibula diaphysis, c. left distal tibia, the arrow points to the rough surface articulating with fibula; 8. cut marks at calcaneus distal end; 9. cut marks at astragalus medial side.

breadth of the distal fibula, which is the greatest breadth of the distal end, and the calcaneus' greatest breadth, which is measured in the antero-posterior direction.

To reach a conclusion as to whether all the bones, or all the bones except the thighbone, are from the same individual, we need a comparison with measurements taken on a large sample of skeletons to find out the individual and sexual variation in the proportion of skeletal elements. Presently, I am not aware that these kinds of data exist. However, it is possible to conclude that all the bones from house 40 originate from a rather large male individual. Particular measurements are greater than or close to the maximal values for wild boar at Vlasac (*Bökönyi 1978*) and Padina (*Clason 1980*), and clearly correspond to the male group, if compared with the Neolithic wild boar remains from Opovo (*Russell 1993*). In any case, remains of probably two wild boars were found in house 40, possibly more then two, which may indicate that in the distribution of the kill, this house for some reason received a good part.

The tarsal bones, talus and calcaneus, together with the distal calf bone, remained in articulation (Figs. 4.6a,b; 7a,b,c). There are no traces of synarthrosis, which would indicate pathological fusing, so it is certain that they were buried in situ as articulated, and not removed from the site afterwards, when the organic tissue had decomposed. The quality of the deposit in which they were embedded, probably enriched by carbonates, made their connection firm even after excavation. In addition, a distal shinbone (Fig. 4.7c) and calf bone shaft (Fig. 4.7b) were found, fitting perfectly the talus and calf bone fragment, indicating that those bones were a continuation of the joint described.

The final lumbar vertebra, as well as left and right pelvic girdle fragments, were attached to the sacrum (Fig. 4.1), while two long bones of the left front leg, the ulna and radius, were also in articulation (Fig. 4.5). Another important observation could be made on this part of the skeleton. The ulna is complete, except for damage to its central portion, while the upper part of the radius is broken. The breakage of both bones was caused by a strong blow, and happened while the tendons, and probably also muscular tissue, were still holding the bones together. The single fragment of long bones in the right front leg, the proximal radius, points to a similar breakage (Fig. 4.4), a consequence of the patterned manipulation of the carcass parts.

We should stress here that we are by no means certain that all the bones found at the site were collected. On the contrary, the excavation technique at Lepenski Vir mainly entailed the taking of only a selection of bones, and this selection was made by an excavator unfamiliar with osteological material. So it is quite possible that we are missing some parts of the carcass originally placed in house 40. In fact, they were primarily collected due to a certain notion in relation to the graves of this house, since the original label bore the legend "animal and human bones". Finally, we should consider whether the bones of wild boar found in house 40 were left in the house as a complete carcass, as meat carcass parts, or just as bones stripped of meat, and if we are dealing with meat carcass parts, whether they were raw, dried or otherwise prepared for consuming. First, it could be safely concluded that there was no complete carcass, since there are proofs of butchering. These are clearly observable on the tarsal bones, in the form of several deep transversal grooves on the calcaneus (Fig. 4.8), and few short grooves on the talus (Fig. 4.9), made in the same direction, and in same action indicating disarticulation of the lower hind leg. There are no cut marks on other bones, but there are indications that other butchering techniques besides cutting might have been applied, such as a blow to the middle of the radius and ulna shafts. The left and right pelvic girdle fragments attached to the sacrum were probably broken in the course of the disarticulation of the left and right flanks.

As we have already concluded that primary butchering was performed, we could further ask whether the butchering process was continued to the point of completely stripping the meat from the bones. In this respect it is important to note that there are no traces of filleting, which would be very difficult if not impossible to perform and avoid the contact of sharp artefacts with the bone necessary for this operation. This is especially true of the shoulder blade, on which filleting leaves a characteristic long longitudinal groove (*Binford 1981.Fig. 4.06*). This leads to the assumption that there were several meat parts present, before the house was abandoned, either as raw meat, or dried, or prepared for drying. A part of the left pelvis fragment was burnt, which could indicate contact with fire or hot smoke while the meat was dried, but we have no other signs which would certify this method of food preparation.

		Lepenski Vir house 40	Vlasac Bökönyi 1978	Padina Clason 1980
sacrum	cranial articular breadth	47.00		
scapula	glenoid process length	51.45	29.0–49.0	
	glenoid cavity length	38.70		
	glenoid cavity breadth	33.55	29.0–34.5	
	scapula neck length	34.05	32.0–33.0	
ulna	length	279.45		
	olecranon length	84.20		
	processus anconaeus depth	55.55		
	olecranon depth	44.70		
	coronoid process breadth	33.85		26.0
left radius	distal end breadth	49.45	41.0–47.0	35.0
	distal end depth	39.40	32.5–36.0	
right radius	proximal end breadth	40.55	39.5–41.0	36.5
	proximal end depth	28.85	26.0–30.0	
femur	distal end breadth	61.00		
tibia	distal end breadth	40.55	32.5–44.0	37.0–40.0
	distal end depth	34.80	29.0–38.0	
fibula	distal end breadth	21.45		
astragalus	lateral half length	50.00	47.0–55.0	50.0–53.0
	distal breadth	31.85	29.0–35.0	29.0–31.0
calcaneus	length	102.90	90.0–107.5	71.5–108.0
	greatest breadth	41.60	37.0–40.5	38.5–44.0

Tab. 1. Sus scrofa, house 40, measurements (mm).

Why was the meat placed within the house?

I consider it is less probable that it was left because of the sudden abandonment of the house. There is evidence that animal parts, specifically red deer antlers, were left in many houses, which certainly was not unplanned and unintentional. An example of antlers in house 28 will be described later in the text. It is more likely that the placement of the wild boar carcass parts in house 40 reflects a common tradition performed in connection

with an abandonment event in house 40 or the settlement itself. The meaning of this custom could have been to make offerings to the house spirits, because of the quitting of the house for a certain period, or because the use of the house was suspended, while life continued in other houses. Otherwise, it may be a case of food storage for the settlement's inhabitants, or even a sympathetic offering to a chance passenger.

Bone raw material collection under the floor of house 47'

House 47' (Fig. 5) is at the edge of the lower terrace and is covered by another house of similar outline, labelled as house 47 (*Srejović and Babović 1983. 138*). House 47' is built above two smaller houses: the rear part of house 53 and the base of house 58. Both houses 58 and 53, and house 47' belong to Lepenski Vir I (*Srejović 1969.Fig. 8, 14, 16; Radovanović 1996*). A large, non-superimposed house, 54, on the left side of this group of houses, and a very small house, 49, to their right, are interpreted as belonging to phase c of Lepenski Vir I (*Srejović 1969. Fig. 15*). The animal bones collected are from below the floor of house 47'. A more precise position is not noted, but they were deposited most probably in the space between houses 58 and 53 (along the west side of house 58, or in front of its left corner, or behind house 53).

The bone assemblage is diverse, both in the species and the skeletal elements present (Tab. 2) (Figs. 6-9). There are the remains of at least 7 animals, belonging to 5 different species (beaver, bear, and three species of deer) so fur and meat animals, large, medium and small are present. There are broken and complete mandibles of several species, two shoulder blades and many fragmented metapodials. Among the unidentified fragments, long bones and metapodial splinters dominate. The composition of the assemblage itself indicates that the reason for its being collected at the site was not the use of the animals' soft parts (meat, skin), but the bones themselves. In fact, there is quite convincing evidence that they were collected as raw material.

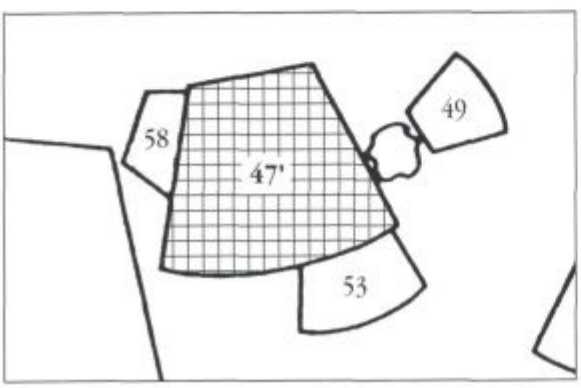

Fig. 5. House 47 (overlaying house 47') and adjacent houses (*after Radovanović 1996*).

Fragmented metapodials are the most representative skeletal part in this respect. The metapodial bones of ruminants, especially of cervids, because of their shape and structure, were the most desirable skeletal part for artefact production throughout the prehistoric periods. A distal metatarsal of roe deer, and 11 fragments of red deer metapodials were found in this assemblage. The red deer metapodials belonged to at least 3 individuals, since among 7 fragments of metatarsals (Fig. 6.3) it was possible to identify two right proximal metatarsal fragments bearing the same elongated facete for articulation with the centrotarsal bone (Figs. 6.3a,c). These fragments would have originated from two individuals. Two remaining proximal fragments are from the left metatarsal, and probably from a single bone (Figs. 6.3b,d). We cannot determine from the proximal parts whether they belonged to fully grown animals, since the proximal epiphysis fuses earlier, but from the two fragments of distal metacarpals, left and right, with fused epiphysis (Figs. 6.1a,b), there is evidence for the existence of at least one fully grown animal. On the other hand, it is not possible to differentiate distal unfused epiphyses and to identify whether they belong to metacarpals, or metatarsals, but since they are of different sizes (Figs. 6.2a,b), and the surface for fusing in the larger specimen is much more compact, revealing a better degree of ossification, it is possible to conclude that they belonged to juvenile individuals of different ages, or in any event, to two different animals. Consequently, the red deer metapodials in the assemblage are from at least three animals, one adult, and two juveniles. All the fragments show certain degree of weathering, having been exposed to atmospheric influence for some time. Their fragmentation started with lengthwise splitting, but continued in various ways. Two fragments belonging to the same left metatarsal (Figs. 6.3b,d) show that the bone was first split lengthwise, which resulted in the separation of these two fragments, but thereafter the larger fragment was broken transversally. The left distal part of the metacarpus (Fig. 6.1a) was modified by flaking its rim. On the diaphysis fragments there are small depressions made by multiplied pressure on the bone, probably in the course of artefact production.

The reason that carpal and tarsal bones of reed deer (Figs. 6.4, 6.5) were found within this assemblage is probably not related to the intention of their further modification, but is the consequence of their being articulated with those bones that were of interest – metapodials. Perhaps someone who had the skill of making artefacts took a part of a skeleton that he knew to be useful for his purpose from a site where primary butchering was taking place, took it to a work area, and disarticulated it as the first step of the work. There are three carpal bones, two of them, the left intermedium and left radiale, probably belonged to the same animal, since their articulations fit perfectly (Figs. 6.4a,b). Another one, the left intermedium, belonged to another animal, probably a young one, as the structure of the bone shows less ossification (Fig. 6.4c). A single phalanx also belonged to a young animal, with unfused proximal epiphysis, and peculiar traces on its diaphysis caused by rodent teeth (Fig. 6.6). It is highly probable that the toolmaker was not always on its working place, so during his absence, a small rodent was sharpening its incisors on this bone while it was exposed on the surface.

Species	Skeletal part	NIS	MNI
Castor fiber (beaver)	mandible	2	1
Ursus arctos (brown bear)	mandible	2	1
Cervus elaphus (red deer)	antler	1	3
	mandible	4	
	upper molar	1	
	scapula	1	
	distal humerus	3	
	distal femur	1	
	distal metacarpal	2	
	proximal metatarsal	3	
	metatarsal diaphysis	4	
	distal metapodial unfused epiphyses	2	
	carpals	3	
	tarsals	1	
	second phalanx	1	
Capreolus capreolus (roe deer)	distal metatarsal	1	1
Cervidae indet. (a species of large deer)	scapula	1	1

NIS – number of identified specimens;
MNI – minimal number of individuals.

Tab. 2. Species and skeletal parts distribution from the area under the floor of house 47'.

The roe deer distal metatarsal (Fig. 7) is also a remnant of lengthways splitting. Its proximal part might have been used for making bone artefacts as well, but this fragment itself shows traces of modification and use. The obliquely broken diaphysis is polished, while its dorsal side has many scratches which are use traces. Its pointed end was broken, perhaps in the course of a working process at the site itself. The other possibility is that the artefact was brought into the workshop to be repaired.

Two shoulder blades found in the assemblage, one from a large species of deer, and another from a red deer, bear clear evidence of filleting in the form of sharp longitudinal furrows (Figs. 8.1c,2b). There are, also, further modifications on the blades, and it is possible to assume that they belonged to carcasses butchered elsewhere and brought to the site as a raw material. These further modifications are best observed on the surface of the large deer shoulder blade (Fig. 8.1c), in the form of multiplied pit-like bone damage, made probably not by direct, but indirect blows or pressure by some implement pressing on the blade, and showing successive movements of that implement, in the course of manufacturing. Two of those groups of pit-like damage lie over the filleting marks, thus demonstrating the sequence of work performed on the bone. Somewhat lower, in the area of the shoulder blade neck, there are two irregular, semi-circular cuts, while the whole surface of the bone is covered with tiny scratches.

The question of identification of the large deer shoulder blade is intriguing. Cervid species of a stature larger than red deer are not recorded in the Postglacial of the region up to date. However, a giant deer, *Megaloceros sp*, and elk, *Alces alces* (Linnaeus), inhabited the central Balkans in the course of the Pleistocene epoch (*Dimitrijević 1983; 1997*), and survived in the Carpathian basin even in the Postglacial period (*Bartosiewicz 1999*). Identification is made more difficult by the fragmented state of the distal articulation, although its circular form and the position of the coracoid process clearly indicate a deer (Fig. 8.1a), and exclude cattle species. The only measurement obtainable, the diameter of the neck of the scapulae (46.1 mm), is greater than the variation range of red deer (33.0–44.0 mm at Vlasac (*Bökönyi 1978*); 27.0–40.0 mm at Padina (*Clason 1980*)). It is possible that the blade belonged to a young animal. Although the co-

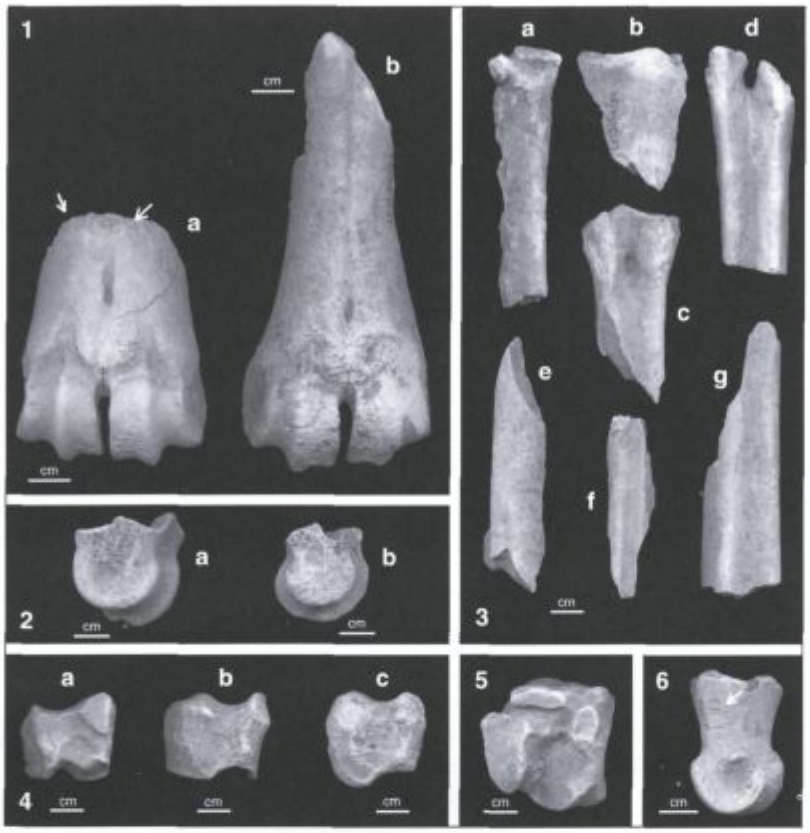

Fig. 6. Cervus elaphus, lower extremital bones: 1. metacarpus dist., dorsal view, a. sinistralis, arrows point to the flaked rim of the fragment; b. dextralis; 2. distal unfused epiphyses, lateral view, a. larger specimen, probably from a slightly older animal, b. smaller specimen, probably from a younger animal; 3. metatarsal fragments, a, c proximal dextralis; b, d proximal sinistralis; e, f, g diaphyses; 4. carpals, a. radiale sin., b. intermedium sin., c. intermedium sin.; 5. centrotarsale, plantar view; 6. phalanx II, lateral view, arrow indicates rodent teeth marks.

racoid process is fused, the structure of the bone inside the glenoid cavity is not very compact, but porous, which is characteristic of young animals.

For the remaining items in the assemblage, represented by skeletal parts not so commonly used in the process of tool making, and not bearing exact modification traces, the intention of including them in this collection of raw material is not so clear. The collection of lower jaws of different species, a deer, a beaver and a bear, is interesting. There are 4 fragments of a red deer's lower jaw, probably belonging to a single branch (Figs. 9.4a–d), thus indicating an in situ breakage. The fragments are heavily weathered and the largest bears cuts and multiple, grouped scratches on the surface. On the other hand, the beaver left and right jaws have almost complete horizontal ramie, and the bear's left mandible even has the incisor part complete, which is the easiest to break down. The beaver left and right mandible branches (Figs. 9.3a,b) belonged to a single lower jaw. There is a conspicuous glow in the simphyseal region, both in the front part, below the incisors, and on the inner sides, on the simphyseal joint itself, which is a possible consequence of its use as a grinder. The presence of beaver mandibles in this context is important, since at the other sites in the Upper Gorge of the Danube, mandibles are overwhelmingly represented among beaver remains (36 mandible fragments against only 5 postcranial bones at Padina [*Dimitrijević and Borić, in preparation*]; 15 mandible fragments among 71 beaver remains at Vlasac, after *Bökönyi 1978*), and there remains the question of the pattern of use of this animal in the Gorges. The incisors are still in place, while they are mostly lacking in the mandible fragments at Padina.

The bear mandible belonged to a young adult animal (Fig. 9.1). There are several short, deep, and sub-parallel cuts in the middle of its basal margin, grouped in two places (Fig. 9.1a). These cuts indicate primary butchering, after which the assumption is that the bone was brought to this site. Besides this left mandible, there is a fragment of a right bear mandible (Fig. 9.2), in the form of a single small basal fragment of a horizontal branch, with old breaks. This could only originate from a heavily fragmented mandible. So, there are two bear lower jaws at the site, one very well preserved, if we exclude excavation breaks, and the other, for some reason, greatly fragmented. The flat mandible surfaces might have had a role in tool manufacturing, but might also have been of interest because of the teeth it contained, among which incisors and canines would have been especially popular for amulet production.

Young deer and brown bear below the floor of the house 31

House 31 is found in the group of houses of Lepenski Vir I positioned in the Middle Terrace (Fig. 10). It is older than houses 18 and 23, since its left front

wing is cut by house 18, while the rear of house 18 is covered by house 23, but probably later than house 19 (*Radovanović 1996*). The bone assemblage to be described was collected from below the floor of house 31, so it was accumulated at an open area of an early settlement phase. The bone assemblage contained large mammal bones, fish teeth and bones, a long diaphysis bird bone, and several human bones, probably in relation to grave 97. The complex stratigraphic situation evokes suspicion concerning the assemblage's unity. However, the remains of two skeletons, one of a young deer (Fig. 12), and another of an adult brown bear (Figs. 11, 13, 14), confirm the unity of the assemblage. Both animals were presumably butchered on the spot, showing in that specified process differences, in respect to their age and size, which influenced the butchering method itself. The following skeleton parts of the young deer were found (Figs. 12.1–13): the lower right mandible, atlas, front legs bones (proximal humerus, radius distal epiphysis, a carpal bone, proximal metacarpals), a pelvic fragment, hind leg bones (distal femur diaphysis and a related, unfused distal epiphysis, proximal parts of the left and right tibia diaphyses, and related right unfused epiphysis, the distal part of the right tibia diaphysis, astragalus, and calcaneus with unfused tuber calcanei), as well as a single third phalanx characterised by porous bone structure indicating incomplete ossification.

All the skeleton parts indicate a young, growing animal. The lower jaw bears milk dentition, the long bones have both proximal and distal epiphyses unfused, and short bones have a porous structure. It is possible to conclude convincingly that these are the remains of a single animal, since all the skeleton parts indicate a similar age.

The most precise age is given by the mandible (Fig. 12.1). It is a right mandibular branch, broken orally at the diastema, while the aboral processi of the vertical ramus are also broken. The first and second decidious molars are in alveoli, while the third milk molar was lost post mortem, but its alveoli are fully preserved. The first milk molar has no traces of crown wear, but on the second, some slight wear is observable on the tips of the crown. There are no traces of the formation of permanent premolar crypts. Behind the third milk molar alveoli, the first permanent molar is erupting, and behind it, the crypt is opened where the germ of the second molar was developing. The mineralisation of the first permanent molar crown is complete, and the infundibulum is well formed. The mandible is broken through the first molar alveoli, and the tooth itself damaged in its lower portion, so it is not possible to observe whether root formation had started, but, since the eruption began, it is to be expected that root formation had also started. This stage of development is corresponding to the age of 4 months (*Brown and Chapman 1991*). This also gives us the season of this animal's death, as well as the season of this particular hunting and butchering episode at Lepenski Vir. Since deer give birth in May/June (*Bützler 1986*), this means that the animal was hunted in the early autumn, most probably in late September or early October.

The epiphyseal fusion is not so accurate for ageing, and it is not studied in detail like tooth eruption, but finds like these remains of a young deer below house 31 could be very important if such a study is going to be made in the future, since they give us a set of data direct from prehistory.

It is important to note that elements of both the left and right front legs were found (fragments of the left and right metacarpals) (Fig. 12.6), as well as those of the left and right hind legs (left and right proximal tibia) (Fig. 12.9), in considering what part of the body was actually present at the site. Though we cannot quite exclude attritional processes, the bones are well preserved, in spite of their porous structure, and the presence of both diaphyses and

Fig. 7. Capreolus capreolus, distal metatarsal, a. dorsal, b. plantar view, arrow indicates broken polished end.

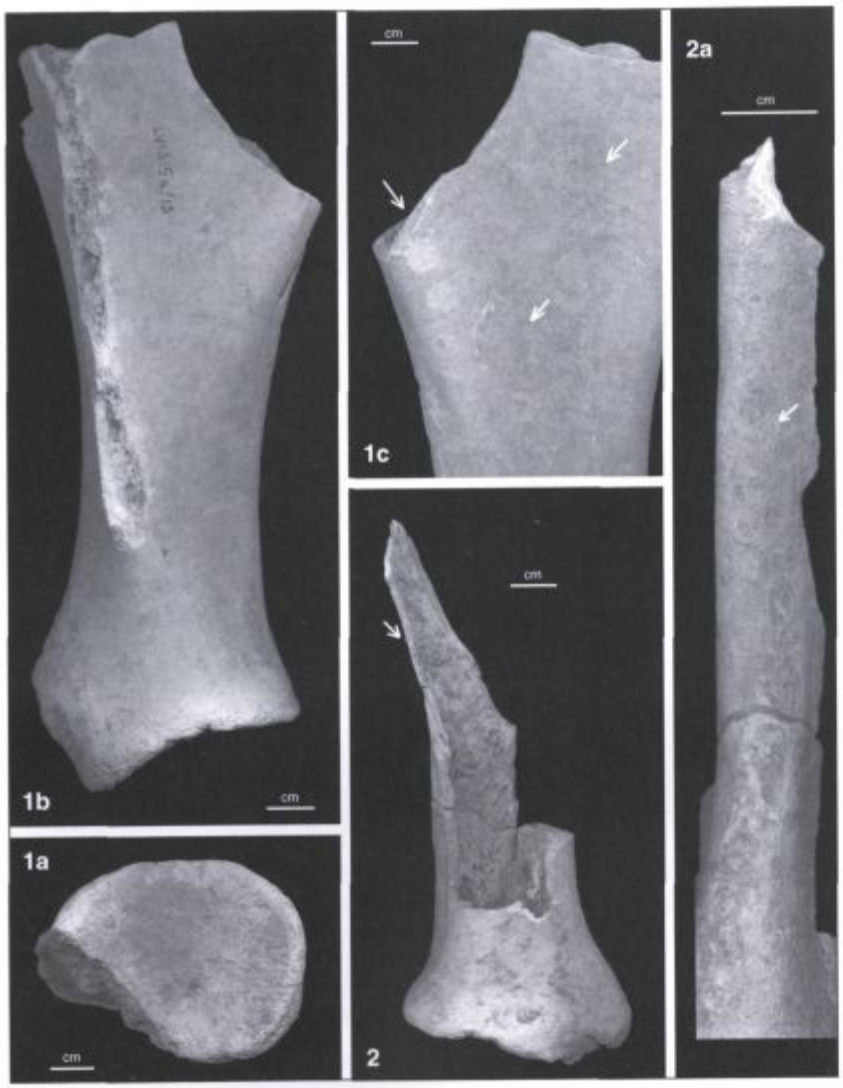

Fig. 8. Scapulae with filleting marks: 1. Cervidae indet., scapula sin., 1a. distal view, 1b. lateral view, 1 c. medial view, detail, upper two arrows point to pitlike depressions, arrow in the middle to longitudinal filleting mark and pitlike depression below crossing over it, and the one at the bottom points to halfcircular incisions; 2. Cervus elaphus, scapula dext., lateral view, 2a. caudal view, detail, arrow points to filleting mark.

epiphyses of unfused long bones (distal femur, proximal and distal tibia) (Figs. 12.8,9,10) and calcaneus (unfused tuber calcanei) (Figs. 12, 13a,b), show that they were not spread out further. It is more probable that not all the bones were collected by the excavators, and it is reasonable to suppose that the whole body, except the head of the animal was at the site.

There are no traces of butchering, but we have to bear in mind that for the butchering of a young animal much less effort is needed, and much fewer interventions made by artefacts. Moreover, cuts made by artefacts on young bones remain mainly in the layer of cartilage, because of which they are not detectable in fossil material, or on porous bone surfaces, where they are not so clearly observable as on compact, mature bones. In addition, since this young deer skeleton was found with the remains of another butchered animal, a brown bear, we should not search for any other reason for its deposition. The brown bear butchered at the site was an adult animal, of a size comparable to representatives of the same species in the region (Tab. 3). According to the skeleton parts' distribution (mandible, vertebral column and rib cage elements represented, both the front and hind legs, as well as both the left and right side of the body) (Figs. 11, 13, 14), the whole carcass was probably butchered on site, excluding possibly only the skull. Unlike the juvenile deer from the same place, traces of primary butchering, as well as traces of further processing of the disarticulated skeleton parts are easily detectable, and they are found on expected places on the bones, and rather easy to interpret.

The articular end of the mandible bears distinct traces of cutting (Figs. 13.1a,b), most probably the consequence of the disarticulation of the mandible from the skull after the masticatory muscle had been already removed. From the vertebral column, two vertebrae are preserved which are mutually articulated, since one is the last thorasic (Fig. 13.2), wearing the anterior demifassete for rib articulation,

humerus	ML distalis	87,9
femur	ML proximalis	86,1
	ML distalis	73,8
radius	ML proximalis	37,6
metatarsus II	length	69,6
metatarsus V	length	82,9

ML – medio-lateral breadth

Tab. 3. Ursus arctos, extremital bones (mm).

and the second has the anterior processi (*praezigapophysys*) well fitting with the posterior processi of the thoracal vertebrae, so this is probably the first lumbar vertebrae (Fig. 13.3). The cut-marks (several short and shallow parallel cuts) are found at the base of the lumbar dorsal spine and derived from the removal of tenderloin (comparable to *Binford 1981.Fig. 4.21*).

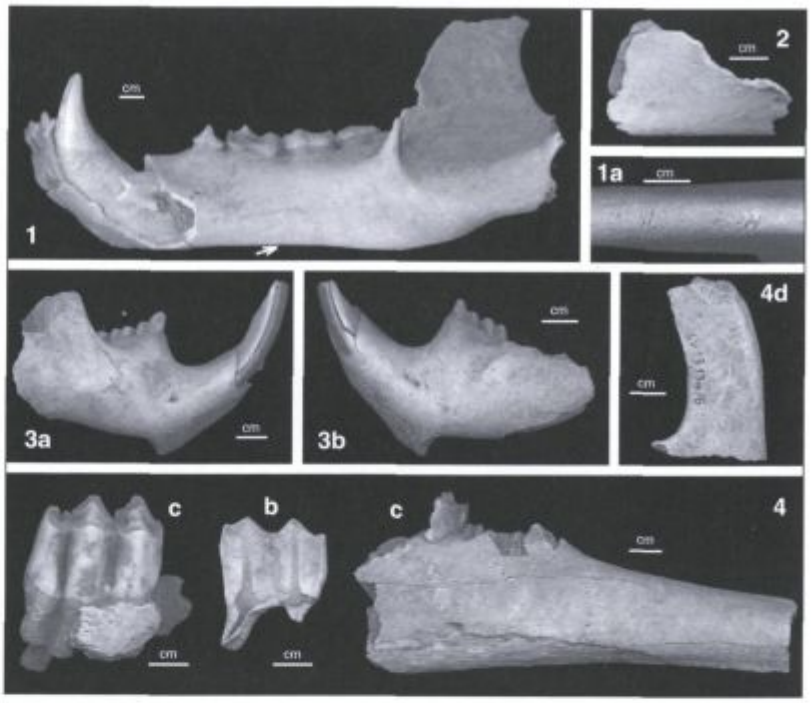

Fig. 9. Mandibles: 1. Ursus arctos, mandible sin., outer view, arrow points to the position of cut marks, 1a. cut marks at basal part of horizontal branch; 2. Ursus arctos, mandible dext., fragment of basal part of horizontal branch; 3. Castor fiber, a. mandible dext., b. mandible sin.; 4. Cervus elaphus, mandible dext., a. fragment of horizontal branch with diastema and fragmented P3 and P4 in alveoli, b. fragment of M2, c. mandible fragment with M3, 4d. coronoid process.

Remarkable cut marks are found on the hip-girdle and long bones, originating both from disarticulation of the long bones from the girdle, and from the further processing of meat parts. At the left hip-girdle (Fig. 13.5), cuts are positioned at the ileum and ischium portions. There are two short parallel cuts at the ileum (Fig. 13.5b), at its narrowest part, while many artefact traces cover the ischium. They were made, if not by different artefacts, then in the course of "operations" of varying intensity: there are short and shallow parallel cuts extending transversally, afterwards a very deep and long single furrow, crossed by a short, deep cut (Fig. 13.5a), while the third group of traces are represented by pit-like notches made by multiple chiselling. At the right hip-girdle fragment the tuberosity at the acetabulum rim is knocked off (Fig. 13.6), which might indicate butchering by blows. There are two more fragments of hip-girdle, impossible to reconstruct with larger fragments, since parts of the broken bone are missing. One reveals longitudinal shallow furrows, most probably filleting marks, and the other is covered by oblique cuts.

From the front leg long bones, a distal humerus and three fragments of a radius were found. The cuts on the humerus are numerous. There are many oblique, sub-parallel cuts, seemingly made with a single artefact and during a single operation of butchering. They are positioned at the medial epicondyle, starting from its base and spreading to the diaphysis uplift (Fig. 13.8a). At the lateral epicondyle crest there are again oblique sub-parallel cuts, but they are

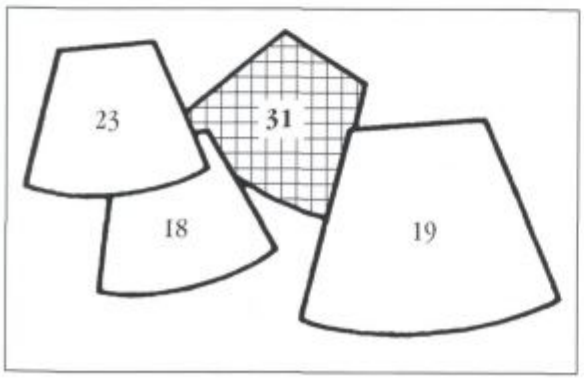

Fig. 10. House 31 and adjacent houses (*after Radovanović 1996*).

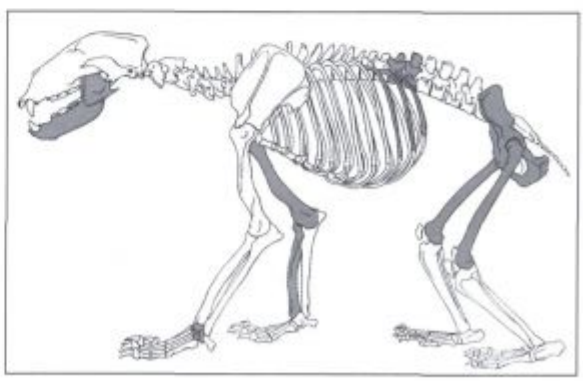

Fig. 11. Bear skeleton with bones found in house 31 shaded.

Fig. 12. Cervus elaphus, infantile: 1. right mandible with milk molars (D2 and D3), and M1 erupting, inner view; 2. atlas, dorsal view; 3. humerus dext. prox., lateral view; 4. radius sin., distal epiphysis; 5. fragment of capitato-trapezoid sin., fragmented, palmar view, articulation fitting to proximal left metacarpal shown in 6b; 6. metacarpus, a. dext. prox., b. sin. prox., c. same bone from the inner aspect showing longitudinal spliting; 7. pelvis dext., fragment acetabulum with fragment of ischium; 8. femur sin., medial view, a. distal end of diaphysis and b. unfused distal epiphysis; 9. tibia dextralis, a. unfused proximal epiphysis, cranial view, b. proximal end of diaphysis, cranial view, c. unfused proximal epiphysis, proximal view, d. tibia sinistralis, proximal end of diaphysis, crista tibiae damaged, cranial view; 10. tibia dext., distal enfused diaphysis; 11. Ph III; 12. astragalus dext., dorsal view, articulation fitting to calcaneus; 13. calcaneus dext., a. unfused tuber calcanei, b. corpus calcanei, medial view.

deeper (Fig. 13.8b) and seemingly made with much more effort, which could derive from cutting the tendon binding the humerus/ulnar articulation in the freshly killed animal (*comparable to Binford 1981. Fig. 4.30.b, Fig. 4.31*). At the trochlea itself, there are no cut-marks, which means that further disarticulation was easy after the tendons binding the humerus and ulna were severed. For the same reason, there are no cut-marks at the radius. Besides the proximal end of the radius (Fig. 13.9), two more radius fragments were found, all with old breaks, showing that further processing was performed on site after primary butchering. Small cuts, found on the diaphysis in two of these three fragments, were probably made when the radius was already separated from the ulna.

From the hind leg long bones, a proximal right (Fig. 13.7) and a distal left part of the femur (Fig. 13.10) were found. At the proximal right femur, damage caused during the dismemberment from the hip-girdle is observable: two cuts on the caput femori, and cuts below the caput on the femur neck (Fig. 13.7a). The interesting feature are several cases of dimple damage below the trochanter minor, which all bear scratches on their bottoms, originating from a multipointed artefact. The remaining part of the diaphysis bears other longitudinal and oblique scratches and cuts, and the end of the fragment was transversely cut after the bone was split longitudinally. On the other hand, the distal end of the left femur bears filleting marks in the form of longitudinal shallow cuts on its diaphyseal part (Fig. 13.10a). There was

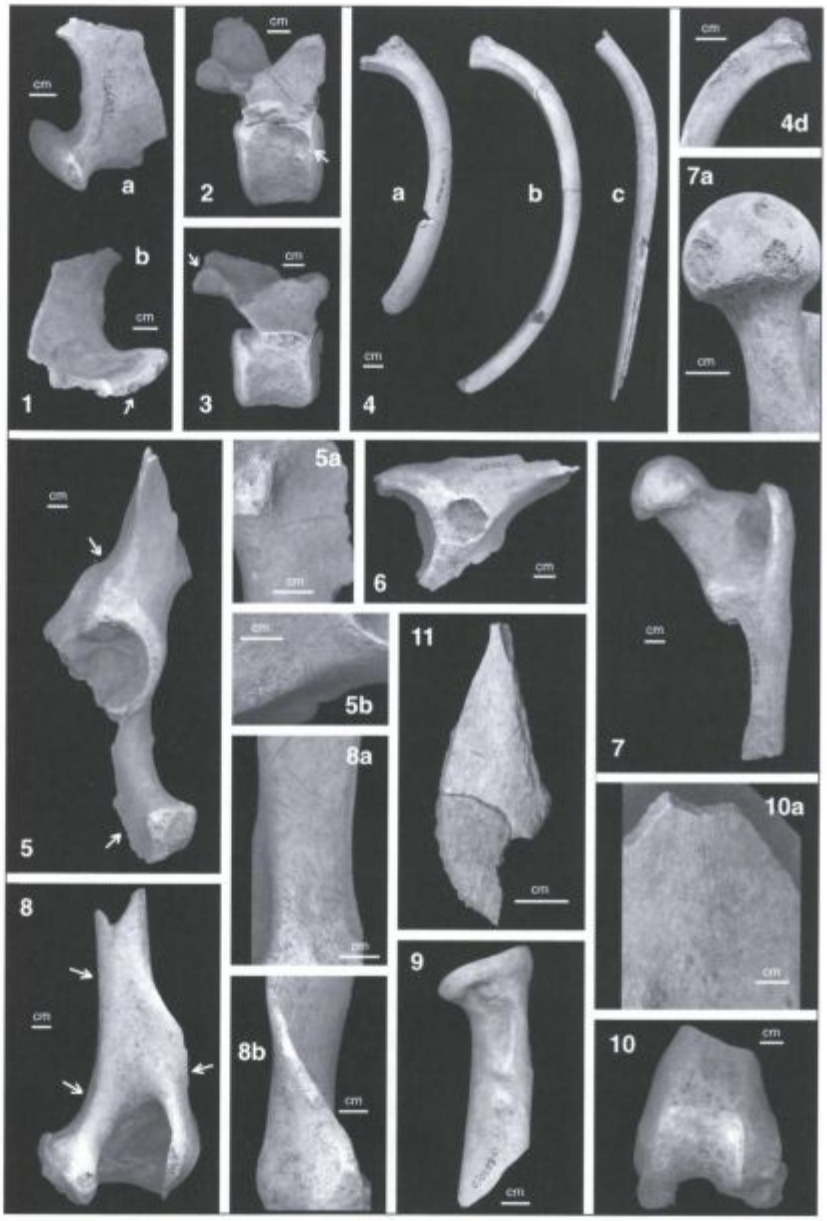

Fig. 13. Ursus arctos, below the floor of the house 31: 1. mandible sin., articular process, a. inner view, b. outer view, arrow points to cut marks made below the articular condyle; 2. last thoracal vertebra, lateral view, cranial side turned to right, arrow points to demifacet for rib articulation; 3. first lumbar vertebra, lateral view, cranial side turned to right, arrow indicates the position of cut marks; 4. a., b., c. three fragmented costae, 4d. cut marks at proximal part of costa shown at 4b, inner side; 5. pelvis sin., arrows point to position of cut marks, 5a. at distal part of ischium, 5b. at narrowest part of ilium; 6. pelvis dext. with damaged tuberosity at the acetabulum rim; 7. femur dext. proximalis, caudal view, 7a. cut marks at caput femoris and neck; 8. humerus dext. dist., caudal view, arrows point to positions of cut marks, 8a. cut marks at medial side, 8b. cut marks at lateral side; 9. radius dext. prox., caudal view; 10. femur sin. dist., cranial view, 10a. same bone, caudal view, detail of the surface covered by filleting marks; 11. fragment of femur diaphysis covered by filleting marks, probably in the continuation of distal femur shown at this figure, 10a.

another fragment of diaphysis belonging to the same distal femur, and showing the same longitudinal grooves, which were obviously a continuation of the grooves found on the larger fragment (Fig. 13.11). Since the breaks are old, it is apparent that after filleting, further breakage of the bone happened on site.

For the assumption that the whole animal was butchered on site, it is important to note the presence of short paw bones from the left anterior leg, and left hind leg. There are 4 carpal bones (Figs. 14.2a–d), well-preserved and not fragmented, belonging to the left front leg, and the second and fourth metatarsal belonging to the hind limb (Figs. 14.1a,b). Two first, three second, and four third phalanges (Figs. 13.3a–h) were found, also well preserved and not fragmented, except a single broken third phalanx. It is not possible to say whether they belong to the front or hind leg. In addition, three sesamoid bones were found (Fig. 14.2e). These bones are small (with a maximum length of 12 mm in this case), bean-like structures, not jointed with other bones, except for muscular tissue and tendons, showing again that the bones of the skeleton did not accumulate independently, but as parts of the skeleton, which primary disarticulation, forced by men, as well as final natural disarticulation, happened at the place.

The deer skull with antlers in house 28

House 28 (Fig. 15) is a non-superimposed house found at the upstream end of the settlement. Its peripheral position and size are similar to house 40, as

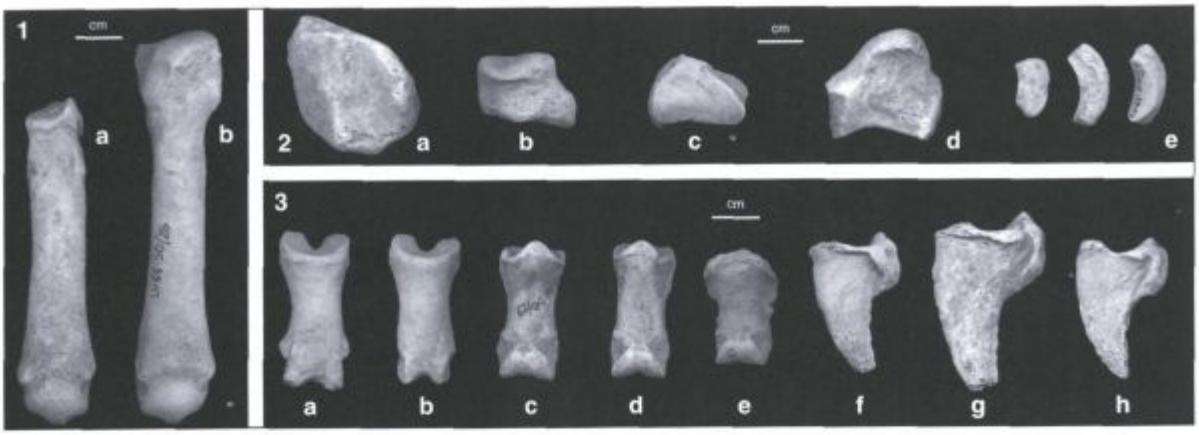

Fig. 14. Ursus arctos, below the floor of the house 31, metapodial and short bones: 1. metatarsalia sinistralis, dorsal view, a. metatarsus II, b. metatarsus IV; 2. a–d. carpalia sinistralis, a. ulnare, b. carpale 1, c. carpale 2, d. carpale 3, e. three sesamoid bones; 3. phalanxes, a–b. first phalanxes, c–e. second phalanxes, f–h. third phalanxes.

well as the arrangement of stone art objects (*Radovanović 1996*). Two sculptures were found, on the right and left sides of a large stone slab in the rear of the house, and because of the large rocks behind it, the house was named "the sanctuary below the rocks" (*Srejović and Babović 1983*).

A red deer skull with antlers was found on the floor. The antlers, both left and right, were preserved at a length of over 50 cm (Fig. 16), and attached to the skull, must have been a voluminous item, whose find itself shows the tradition of the placement of particular skeletal parts of animals in the course of house abandonment. The skull was damaged when lifted from the position where it lay to such an extent that it is not possible to reconstruct it. A delicate structure of bones, rather thin and unfused skull roof bones, and fragile processes contributed to this. However, it is possible to observe that the frontal, temporal and occipital parts of the skull were present, together with the left and right upper jaws. The bones of the face, the nasals and praemaxillars, were not identified.

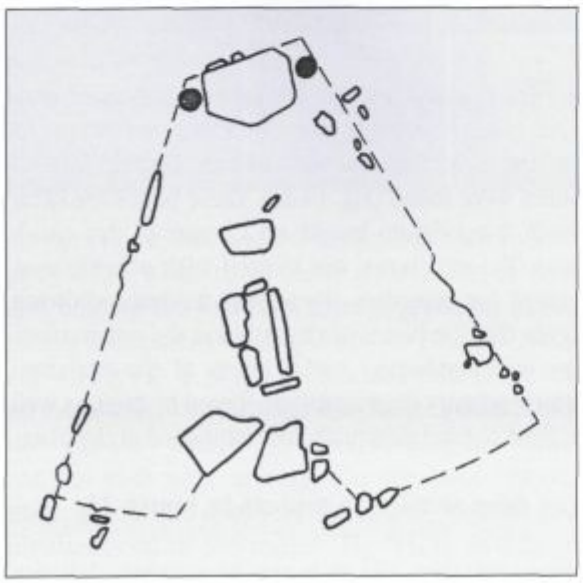

Fig. 15. House 28, Lepenski Vir I (*after Srejović and Babović 1983*).

The animal's age is clearly indicated by its upper teeth, which are in the last stage of milk/permanent dentition replacement and with the last permanent teeth erupting (Fig. 17). Both third milk molars are still holding above the crowns of permanent fourth premolars, although half of the crown of the one on the right side of the jaw is worn out (Fig. 17b); it would have been a matter of days before they fell out. The second and third premolars are erupting, as well as the third molar, preserved only in the left jaw. This stage of dental development in the upper jaw should be analogous to that in the lower jaw, and related to an age of 27 months (*Brown and Chapman 1991*). Since deer give birth in May/June (*Bützler 1986*), this means that the animal was hunted in the early autumn, most possibly in the late September or early October.

The antlers are asymmetrical: the right one consists of a single branch, with just a slight protuberance at the site of the brow tine, while the left antler has a brow tine and simple crown with two tines. Due to their age they are extremely thin (right burr circumference 126 mm, left burr circumference 123 mm, right column circumference, 10 cm from the burr, 80 mm; the same measurement in the left column 76 mm). Although variability in red deer antlers is well known (*Dragičić 1957*), antlers from house 28 should be characterised as unusual in their length and asymmetry.

CONCLUSION – THE ARCHAEO-ZOOLOGY OF TROPHIES

The osteological material described here is not what we are generally accustomed to as animal remains on archaeological sites – a tiresome piles of bone fragments, the remnants of meals and activities difficult to reconstruct, when the main discussion after a thorough analysis is related to measurements and statistics of those many fragments arranged by species and skeletal parts. It is rather what one might describe as a collection of trophies. It seems justifiable to use this expression, since the hunted animals presented, and their particular importance for the society dwelling at Lepenski Vir, and because the units described here related to houses and defined areas between houses, are so precious from the archaeo-zoological point of view, as trophies are for hunters, and finally, because the placement of animal remains in houses in particular instances, especially of red deer antlers, had meaning beyond their economic value.

Red deer skulls with antlers have been found in at least 13 houses at Lepenski Vir (*Bökönyi 1969*). As has been stressed by the inspired doyen of Lepenski Vir culture research, Srejović (*1969.137*), red deer antlers symbolise connections of death and renewed birth, in relation to their unique feature of growing and rejecting yearly cycle, and their amazing ability to grow bigger, stronger and more beautiful every year.

The voluminous antlers on deer skulls positioned on the house floor point further to an item very important for understanding the "life cycle" of the houses themselves, if not the entire settlement. Their deposition marks a time when the house fell into disuse, the house abandoned, and shows that this event was, besides its practical connotations, also of symbolic importance. It also suggests it was prepared. A question remains as to whether house abandonment was a patterned ritual unique to every house, or whether it changed diachronically through the succeeding phases of Lepenski Vir settlement.

Although all the antlers and skulls found in these contexts were not collected during the excavation, because of their volume and apparent meaning, they could not have remained unobserved; they were noted and described. This was not necessarily the case with other osteological finds deposited in the houses, especially if they were smaller skeleton elements, or remains of smaller animals. In this respect,

Fig. 16. Cervus elaphus, house 28, left and right antler, frontal view.

the assemblage from house 40 is important. This assemblage, originating from a part of a wild boar carcass, left in the house either as fresh or dried meat, indicates also a situation at the time of the house being abandoned. There is a possibility that the departure in this case was sudden and unwilling. However, a thoughtful and prepared departure might be a more plausible scenario, especially considering the symmetrical position, similar size and arrangement of stone art objects in relation to house 28, with deer skull and antlers. Whether there is a temporal connection between these two house abandonment events, or at least whether houses 28 and 40 belonged to the same building horizon might be enlightened only by absolute dating.

The other two units described in this paper also depict particular events: episodes in the communal life of the settlement. The assemblage found in the area later covered by house 31 contains the bones two animals. They were brought into the settlement after hunting, and butchered on the spot, possibly, but not necessarily at the same time. The remains of one of them, a young deer, point to the same hunting season, early autumn, as well as the deer skull from house 28. The identification of when a particular animal died leads us to the expectation that through

the analysis of animal remains, such as large mammals, but also fish, and even birds, might connect exploitation of certain animal species with a specific time of the year. This would undoubtedly help in understanding the "life cycle" of houses and the settlement itself.

Another assemblage, found at an area later covered by house 47', indicates an activity that is to be expected in a settlement of the period: work on bone as a raw material. The bones found in the assemblage are not the final products of a bone workshop, which we are used to seeing reflected in an inventory of bone artefacts from an archaeological site, but mainly products of the initial phases of working on bone material. There are parts of skeletons of various species that were brought to the spot and disarticulated as the first step in the working process, while particular bones were further split, flaked or modified in another way.

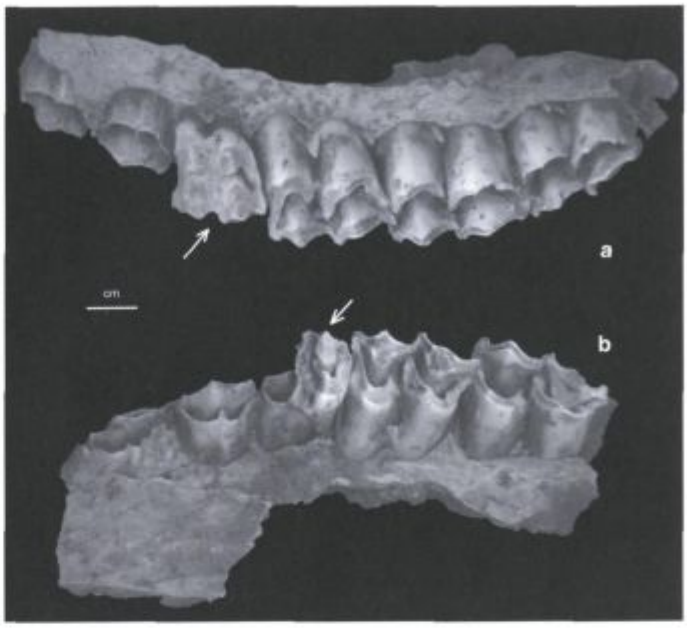

Fig. 17. Cervus elaphus, house 28, upper jaw, arrows point to third decidious premolars hanging above forth permanent premolars: a. P2-M3 dext., b. P2-M2 sin.

Enlightening utilitarian activities in the open areas within the settlement, presented in the osteological material found below the floors of houses 31 and 47', remind us of the general importance of animals in the subsistence strategy, but also to the probability that the foundation of settlements on the Danube's banks in the Iron Gates was primarily initiated by animal exploitation. The importance of animal resources for subsistence continued throughout the development of the Lepenski Vir culture, and is reflected in shared activities exemplified in the archaeological record. But the animals also played a role in the sphere beyond economic importance, and their remains are found in symbolic relation to important events, like the abandonment of a house.

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REFERENCES

BARTOSIEWICZ L. 1999. The emergence of holocene faunas in the Carpathian Basin: a review. In Benecke N. (ed.), *The Holocene History of the European Vertebrate Fauna, Modern Aspects of Research, Workshop, 6th to 9th April 1998, Berlin.*

BINFORD L. 1981. *Bones, ancient men and modern myths. Studies in Archaeology.*

BÖKÖNYI S. 1969 Kičmenjaci (prethodni izveštaj). In Srejović D. (ed.), *Lepenski Vir, Nova praistorijska kultura u Podunavlju: 224-228.*

1978. The vertebrate fauna of Vlasac. In Srejović D. and Letica Z. (eds.), *Vlasac Vol. II: 35-65.*

BROWN W. and CHAPMAN N. 1991. Age assessment of red deer (Cervus elaphus): from a scoring scheme based on radiographs of developing permanent molariform teeth. *J. Zool. Lond. 225: 85-97.*

BULL D. and PAYNE S. 1982. Tooth eruption and epiphysial fusion in pigs and wild boar. In Wilson B., Grigson C. and Payne S. (eds.), *Ageing and Sexing Animal Bones from Archaeological Sites, BAR British Series 109: 55-71.*

BÜTZLER W. 1986. Cervus elaphus Linnaeus, 1758 - Rothirsch. In Niethammer J. and Krapp F. (eds.), *Handbuch der Säugetiere Europas, Band 2/II: 107-139.*

CLASON A. 1980. Padina and Starčevo: game, fish and cattle. *Palaeohistoria XXII: 141–173.*

ČANAK-MEDIĆ 1970. Radovi na spašavanju Lepenskog Vira u 1970. godini. *Saopštenja IX: 5–15.*

DIMITRIJEVIĆ V. 1983. Pleistocenski cervidi okoline Beograda. Diplomski rad, Rudarsko-geološki fakultet, Univerzitet u Beogradu, Beograd.

1997. Upper Pleistocene mammals from cave deposits of Serbia. *Geološki anali Balkanskog poluostrva 61, 2: 179–370.*

DIMITRIJEVIĆ V. and BORIĆ D. in preparation. Animal bones from the site of Padina in the Iron Gates, Serbia. In B. Jovanović (ed.), *Padina.*

DRAGIŠIĆ 1957. *Jelen.* Lovačka knjiga. Zagreb.

DRIECH von den A. 1976. *A Guide to the Measurement of Animal Bones from Archeological Sites. Peabody Museum Bulletin 1.* Harvard University, Cambride, USA.

HABERMEHL K–H. 1975. *Die Altersbestimmung bei Haus – und Labortieren.* Paul Parey, Berlin.

RADOVANOVIĆ I. 1996. *The Iron Gates Mesolithic.* Ann Arbor: International Monographs in Prehistory, Archaeological Series 11.

RUSSELL N. 1993. *Hunting, Herding and Feasting: Human Use of Animals in Neolithic Southeast Europe.* University of California at Berkeley.

SREJOVIĆ D. 1966. Lepenski Vir, Boljetin – neolitsko naselje. *Arheološki pregled 8: 94–96.*

1966a. Lepenski Vir – a new prehistoric culture in the Danubian region. *Archaeologia Iugoslavica VII: 13–17.*

1969. *Lepenski Vir, Nova praistorijska kultura u Podunavlju.* Srpska književna zadruga, Beograd.

SREJOVIĆ D. and BABOVIĆ L. 1983. *Umetnost Lepenskog Vira.* Beograd.