16. Ostanki velikih sesalcev v Vikotrjevem spodmolu

16. Remains of Large Mammals in Viktorjev Spodmol

Borut Toškan & Janez Dirjec

V okviru sondiranja najdišča Viktorjev spodmol pri Škocjanskih jamah se je, poleg drugega, nabralo tudi 12.376 ostankov velikih sesalcev. Vsaj do nivoja rodu jih je bilo mogoče določiti 584 (tj. 4,7 %) in te smo pripisali 22-im vrstam iz osmih družin (razpredelnica 16.1). Z izjemo losa in izumrlega tura lahko vse navedene vrste v Sloveniji najdemo še danes. Sicer pa lahko izkopani sediment časovno umestimo v dve obdobji: starejše je z arheološkimi najdbami datirano v kastelnovjen (*castelnovien*: pribl. 8600 do pribl. 7400 let pred sedanjostjo (BP); Broglio in Improta 1995, oziroma od 8140 do 6020 BP; Turk, ta zbornik), medtem ko naj bi se pretežni del usedlin iz mlajše faze odložil v prazgodovinskem obdobju, najverjetneje v starejši železni dobi (Turk in Velušček, ta zbornik).

Obravnavani osteodontološki material je bil zbran v treh zaporednih fazah izkopavanj, pri katerih so bile uporabljene različne tehnike in metode (glej Turk, ta zbornik). Sprva je bilo opravljeno klasično izkopavanje s sprotnim pregledovanjem usedlin na terenu brez spiranja (faza Viktor), sledilo je spiranje in rutinsko pregledovanje že odkopanih usedlin (faza Viktor in IzA), ob koncu pa je bilo izvedeno še mini stratigrafsko izkopavanje (osnovna enota kvadrat 0,2 x 1 m; reženj debeline 5 cm) s spiranjem in večkratnim pregledovanjem spranih usedlin (faza IzA). Pri spiranju so bila uporabljena sita z velikostjo luknjic 3 mm, 1 mm in 0,5 mm. Upoštevaje te kriterije smo v tri sklope razdelili tudi izkopane ostanke (razpredelnica 16.1).

Pri določitvi subfosilnih kostnih in zobnih elementov so nam bili v pomoč fosilni in recentni primerjalni material iz Slovenije (zbirki Inštituta za arheologijo ZRC SAZU in Katedre za paleontologijo NTF Univerze v Ljubljani) ter podatki iz literature (npr. Boessneck 1972; Schmid 1972; Payne 1985; Prummel in Frisch 1986; Hillson 1986; 1992). Določali smo ostanke vseh skeletnih elementov z izjemo reber ter večine vretenc; od slednjih smo determinirali le *atlas* in *epistropheus*. Med pregledovanjem materiala smo beležili tudi primerke s sledovi zverskih zob in človekovega delovanja (vrezi, zasekanine, ožganost). Ocene starosti živali ob zakolu/uplenitvi so temeljile na analizi obrabe zob (Habermehl 1961; Payne 1973; 1987; Rolett in Chiu 1994) ter na deležu fragmentov z nezraščenima epi- in diafizo (Silver 1972;

Within the framework of the test excavation of Viktorjev spodmol by Škocjanske jame (Škocjan Caves), in addition to other finds, 12,376 remains of large mammals were collected. Of these, 584 (i.e. 4.7%) could be identified at least to the level of genus and were ascribed to 22 species from eight families (Table 16.1). With the exception of elk and the now extinct aurochs, all the mentioned species can be still found in Slovenia today. The excavated sediments can be placed in two time periods: the older is dated with archaeological finds to the Castelnovian (approx. 8600 to approx. 7400 BP); Broglio in Improta 1995, or from 8140 to 6020 BP; Turk, this volume), while the predominant part of the sediments from the younger phase were deposited in the Prehistoric period, probably in the Early Iron Age (Turk and Velušček, this volume).

The osteodontological material dealt with was collected in three successive phases of excavation, in which different techniques and methods were used (see Turk, this volume). At first, classical excavation was performed with simultaneous examination of the sediments in the field without sieving (Viktor phase), followed by wet sieving and routine examination of the already excavated sediments (Viktor and IzA phase). Finally a mini stratigraphic excavation was performed (basic unit 0.2 x 1 m; thickness of spits 5 cm) with wet sieving and multiple examination of the sieved sediments (IzA phase). For sieving, screens with hole sizes of 3 mm, 1 mm and 0.5 mm were used. The excavated remains were divided into the three phases taking into account these criteria (Table 16.1).

In the identification of sub-fossil remains and teeth elements, we were assisted by fossil and recent comparative material from Slovenia (collections of the Institute of Archaeology ZRC SAZU and the Department of Palaeontology of the NTF, University of Ljubljana) and data from the literature (e.g. Boessneck 1972; Schmid 1972; Payne 1985; Prummel and Frisch 1986; Hillson 1986; 1992). We identified the remains of all skeletal elements with the exception of ribs and the majority of vertebrae; of the latter, we identified only *atlas* and *epistropheus*. Among the material examined, we also recorded specimens with gnawing marks and traces of human action (cut marks, chop marks, bur-

Moran in O'Connor 1994). Pri biometrični analizi smo upoštevali smernice, ki jih je objavila Von Driescheva (1976). Ob tem kaže poudariti, da dimenzije posameznih skeletnih elementov (glej prilogo) in podatke o starostni strukturi v vzorcu zastopanih živali podajamo le informativno. Skromno število najdb namreč ne dopušča oblikovanja reprezentativnih vzorcev, ki bi v zadovoljivi meri povzemali intraspecifično variabilnost obravnavanih populacij.

Kvantitativne primerjave med taksoni temeljijo na številu določenih primerkov (*Number of Identified Specimens*, NISP). Kljub nekaterim šibkim točkam, ki jih NISP vsekakor ima (glej npr. Klein in Cruz-Uribe 1993), se namreč zdi uporaba bolj sofisticiranih kazalcev abundance v primeru tako skromnih vzorcev manj primerna alternativa. Pri statističnih analizah smo uporabljali neparametrične prijeme (Spearmanov r, χ^2-test, Mann-Whitneyjev U-test; StatSoft, Inc. 2001), saj podatki niso normalno porazdeljeni, kršena pa je tudi homogenost

ning). Assessments of the age at death of the animals were based on analysis of tooth wear (Habermehl 1961; Payne 1973; 1987; Rolett and Chiu 1994) and on the share of fragments with unfused epi- and diaphyses (Silver 1972; Moran and O'Connor 1994). In biometric analysis, we followed the guidelines published by Von Driesch (1976). It is worth stressing that the dimensions of individual skeletal elements (see annexes) and data on the age structure of animals represented in the sample are given only informatively. The modest number of finds, namely, does not allow the formation of representative samples which would satisfactorily summarise the intra-specific variability of the populations treated.

Quantitative comparisons between taxa are based on the number of identified specimens (NISP). Despite some weak points which NISP certainly has (see e.g., Klein and Cruz-Uribe 1993), the use of more sophisticated indicators of abundance in the case of such modest samples seems a less suitable alternative. With sta-

Razpredelnica 16.1: Število določenih primerkov (NISP) posameznih taksonov velikih sesalcev, zastopamih v Viktorjevem spodmolu, za vsako od treh faz izkopavanj. Identifikacija simbolov: vzorec 1 - faza Viktor, vzorec 2 - faza Viktor in IzA in vzorec 3 - faza IzA. Za obrazložitev glej besedilo.
Table 16.1: Number of identified specimens (NISP) of individual taxa of large mammals represented in Viktorjev spodmol, for each of the three phases of excavation. Identification of symbols: sample 1 -Viktor phase, sample 2 -Viktor and IzA phase and sample 3 -IzA phase. See text for explanation.

Takson / Taxon	Vzorec / Sample 1		Vzorec / Sample 2		Vzorec / Sample 3		SKUPAJ / TOTAL	
	NISP	% NISP	NISP	% NISP	NISP	%NISP	NISP	% NISP
Cervus elaphus	84	38,0	10	11,1	74	27,3	168	28,8
Sus sp.	56	25,2	15	16,7	76	27,6	147	25,3
Lepus europaeus	15	6,8	30	33,3	58	21,2	103	17,6
Meles meles	10	4,5	5	5,6	15	5,5	30	5,1
Ovis s. *Capra*	5	2,3	6	6,7	12	4,4	23	3,9
Ovis aries	4	1,8			2	0,7	6	1,0
Capra hircus	2	0,9					2	0,3
Vulpes vulpes	8	3,6	9	10	5	1,8	22	3,8
Capreolus capreolus	8	3,6	3	3,3	10	3,7	21	3,6
Bos taurus	10	4,5			1	0,4	11	1,9
Bos cf. *primigenius*	4	1,8					4	0,7
Bos sp.					1	0,4	1	0,2
Felis sp.	6	2,7	4	4,4	2	0,7	12	2,0
Canis familiaris	1	0,5			7	2,6	8	1,4
Ursus arctos	3	1,4	5	5,6	1	0,4	9	1,5
Martes sp.	3	1,4	3	3,3	6	2,2	12	2,0
Lutra lutra	1	0,5			1	0,4	2	1,0
Alces alces					1	0,4	1	0,3
Lynx lynx	1	0,5					1	0,2
Mustela putorius					1	0,4	1	0,2
SKUPAJ / TOTAL NISP	221	100	90	100	273	100	584	100
N vseh fragmentov N of all fragments	640		5.294		6.442		12.376	
% določljivega % determinable	34,5 %		1,7 %		4,2 %		4,7 %	

variance. Statistična obdelava je bila narejena s programskim paketom StatSoft 2001, STATISTICA za Windows, verzija 6.0.

V besedilu označujemo kočnike kot: P - predmeljaki, M - meljaki; velike tiskane črke označujejo gornje zobe, male pa spodnje. Položaj posameznega meljaka v zobnem nizu je označen s številko (anteriorno → posteriorno).

16.1 Taksonomija

Red: Zajci in žvižgači (Lagomorpha)
Družina: Zajci in kunci (Leporidae)

Lepus europaeus Pallas, 1778

Gradivo:

- Faza Viktor, plast s keramiko: humerus (1 fragment), femur (4 fr.), tibia (1 fr.); premešano: mandibula (2 fr.), dens (2), calcaneus, ulna (1 fr.), phalanx I
- Faza Viktor in IzA: dens (2), humerus (1 fr.), ulna (1 fr.), metacarpus, ossa coxae (1 fr.), tibia (1 fr.), os tarsale, metatarsus (7 fr.), metapodium (5 fr.), phalanx I (4), phalanx II (4)
- Faza IzA: 58 ostankov (gl. razpredelnico 16.2)

Ostanki poljskega zajca zasedajo s 17,6-odstotnim deležem tretje mesto med vsemi taksoni, zastopanimi v Viktorjevem spodmolu (razpredelnica 16.1). V zgornjih (prazgodovinskih) režnjih stratigrafskega izkopavanja profila Viktorjeve sonde (tj. faza IzA) je zajec s 40-odstotnim deležem celo daleč najbolje zastopana vrsta (sl. 16.5b). Dolge kosti so praviloma zdrobljene, nismo pa zasledili nikakršnih sledov vrezov, zasekanin ali zverskih zob.

Zaradi odsotnosti nepoškodovanih dolgih kosti smo se pri determinaciji srečali s problematiko ločevanja med poljskim zajcem in kuncem *Oryctolagus cuniculus* Lin-

Sl. 16.1: Spodnja čeljustnica (lateralno) poljskega zajca *Lepus europaeus* iz Viktorjevega spodmola (faza IzA: reženj 5). Merilo je podano v cm. Foto M. Grm.
Fig. 16.1: Mandible (lateral aspect) of hare *Lepus europaeus* from Viktorjev spodmol (IzA phase: spit 5). Measurements are given in cm. Photo M. Grm.

tistical analyses, we used non-parametric techniques (Spearman's r, χ^2-test, Mann-Whitney U-test; StatSoft, Inc. 2001), since data are not normally distributed, and the homogeneity of variance is also infringed. Statistical processing was done with the software StatSoft 2001, STATISTICS for Windows, version 6.0.

In the text we characterise cheek-teeth as: P - premolars, M - molars; capitals signify upper teeth, small letters lower teeth. The number denotes the position of a particular tooth in the tooth-row (anterior → posterior).

16.1 Taxonomy

Order: Rabbits and Pikas (Lagomorpha)
Family: Rabbits and Hares (Leporidae)

Lepus europaeus Pallas, 1778

Material:

- Viktor phase, layer with pottery: humerus (1 fragment), femur (4 fr.), tibia (1 fr.); mixed: mandibula (2 fr.), dens (2), calcaneus, ulna (1 fr.), phalanx I
- Viktor and IzA phase: dens (2), humerus (1 fr.), ulna (1 fr.), metacarpus, ossa coxae (1 fr.), tibia (1 fr.), os tarsale, metatarsus (7 fr.), metapodium (5 fr.), phalanx I (4), phalanx II (4)
- IzA: 58 remains (see Table 16.2)

Remains of hare, with a 17.6 percent share, occupy third place among all taxa represented in Viktorjev spodmol (Table 16.1). In the upper (Prehistoric) spits of the stratigraphically excavated profile of Viktor's test trench (i.e. IzA phase) hare, with a 40 percent share, is even by far the most represented species (Fig. 16.5b). Long bones are generally fragmented, but we found no trace of cuts, chop marks or gnawing.

Because of the absence of undamaged long bones, we had difficulty distinguishing between hare and rabbit *Oryctolagus cuniculus* Linnaeus, 1758. Clutton-Brock (1999) suspects that the rabbit was only introduced to central Europe from the Pyrenean peninsular by the Romans, on the basis of which its presence in Mesolithic and Prehistoric layers of Viktorjev spodmol would be excluded. The only sufficiently well preserved mandible (IzA phase: spit 5) corresponds morphologically with hare (Fig. 16.1; Kryštufek 1991) and is thus in full agreement with this. The same is true for the length of the tooth-row of the aforementioned specimen (i.e. 18 mm), which lies within the range seen in recent *L. europaeus* (17-20 mm; Lavocat 1966) and thus exceeds values for recent *O. cuniculus* (11-16 mm; Lavocat 1966). In the Mesolithic layers of Pečina na Leskovcu (*Grotta Azzurra*; *Cremonesi et al.* 1984) on the Triestine Karst and Pečina pri Bjarču (*Riparo di Biarzo*; Rowley-Conwy 1996) in the valley of the Nadiža (Natisone), two frag-

Razpredelnica 16.2: Število določenih primerkov (NISP) za vsakega od taksonov velikih sesalcev, zastopanih v Viktorjevem spodmolu po skeletnih elementih. Podatki se nanašajo izključno na ostanke iz faze IzA.
Table 16.2: Number of identified specimens (NISP) for each taxon of large mammal represented in Viktorjev spodmol by skeletal elements. Data refer exclusively to remains from the IzA phase.

Takson Taxon	rog / antler	cranium	os maxillare	mandibula	dens	epistropheus	scapula	humerus	radius	ulna	carpalia	metacarpalia	phalanx I	phalanx II	phalanx III	ossa sesamoidea	os coxae	femur	patella	tibia	fibula	calcaneus	astragalus	ostali tarsalia	metatarsalia	indet. metapodium	SKUPAJ TOTAL
L. europaeus		1		2	5	1		2	1				7	6	1	1		2		5		2	3	7	9	3	58
M. meles				2	9			1				1	1												1		15
M. putorius											1																1
Martes sp.					2			2				1										1					6
L. lutra					1																						1
V. vulpes					3									1				1									5
C. familiaris					2					1			1	2	1												7
U. arctos												1															1
Felis sp.					1																		1				2
Sus sp.		1	4	1	28		3				1	3	5	10	8			1			2				3	6	76
C. elaphus	20			1	9		1	1	2	4	3	4	6	8	1	2	3					2		1	3	3	74
C. capreolus					5							1	1		1										1	1	10
A. alces					1																						1
Ovis s. *Capra*					5				1				3	1						1						1	12
O. aries													1					1									2
B. taurus					1																						1
Bos sp.					1																						1
SKUPAJ TOTAL	20	2	4	6	73	1	4	6	4	5	5	11	25	28	12	4	3	5	0	6	2	5	4	8	17	15	273

naeus, 1758. Clutton-Brock (1999) sicer domneva, da naj bi kunca s Pirenejskega polotoka v osrednjo Evropo prenesli šele Rimljani, na osnovi česar bi lahko njegovo prisotnost v mezolitskih in prazgodovinskih plasteh Viktorjevega spodmola izključili. Skladna s tem je tudi edina dovolj dobro ohranjena spodnja čeljustnica iz režnja 5 (faza IzA), ki morfološko povsem ustreza poljskemu zajcu (sl. 16.1; Kryštufek 1991). Naveden primerek se tudi v dolžini zobnega niza (18 mm) uvršča znotraj variacijske širine za recentno vrsto *L. europaeus* (17-20 mm; Lavocat 1966) ter tako presega vrednosti za recentne *O. cuniculus* (11-16 mm; Lavocat 1966). V mezolitskih plasteh Pečine na Leskovcu s Tržaškega krasa - *Grotta Azzurra* (Cremonesi *et al.* 1984) in Pečine pri Bjarču v dolini Nadiže - *Riparo di Biarzo* (Rowley-Conwy 1996) sta bila sicer najdena dva fragmenta kunčjega skeleta, vendar pa ob sicer vsesplošni odsotnosti omenjene vrste v mezolitskih in prazgodovinskih plasteh severovzhodne Italije (Bon *et al.* 1991) ne moremo izključiti možnosti, da gre v primeru obeh zgoraj omenjenih mezolitskih kunčjih najdb dejansko za kontaminacijo.

ments of rabbit skeleton were found. Nevertheless, in view of the complete absence of this species in Mesolithic and Prehistoric layers of northeast Italy (Bon *et al.* 1991) the possibility that both the aforementioned Mesolithic rabbit records are actually a contamination cannot be excluded.

Order: Carnivores (Carnivora)
Family: Bears (Ursidae)

Ursus arctos Linnaeus, 1758

Material:

- Viktor phase, layer without pottery: humerus (1 fr.); mixed: phalanx II (1 fr.), phalanx III (1 fr.)
- Viktor and IzA phase: os sesamoideum (4), phalanx III (1 fr.)
- IzA phase: os metacarpus

Finds of brown bear represent only 1.5 percent of all identified specimens in the entire sample from Viktorjev spodmol. Other contemporary sites on the Kras (e.g.,

Red: Zveri (Carnivora)
Družina: Medvedi (Ursidae)

Ursus arctos Linnaeus, 1758

Gradivo:
- Faza Viktor, plast brez keramike: humerus (1 fr.); premešano: phalanx II (1 fr.), phalanx III (1 fr.)
- Faza Viktor in IzA: os sesamoideum (4), phalanx III (1 fr.)
- Faza IzA: os metacarpus

Najdbe rjavega medveda predstavljajo v celotnem vzorcu iz Viktorjevega spodmola le poldrugi odstotek vseh določljivih primerkov. Podobno sliko kažejo tudi druga sočasna najdišča s Krasa (npr. Cremonesi *et al.* 1984; Meluzzi *et al.* 1984; Pohar 1990, Turk *et al.* 1993) in Istre (Miracle *et al.* 2000; 2002). V vseh navedenih primerih namreč delež rjavega medveda nikoli ne presega petih odstotkov, večkrat pa v izkopanem materialu sploh ni bil zastopan. Takratne skupnosti se očitno za lov na medveda praviloma niso odločale, redki uplenjeni primerki pa bi bili lahko tudi rezultat obrambnega dejanja (Bartosiewicz 1999).

Družina: Psi (Canidae)

Canis familiaris Linnaeus, 1758

Gradivo:
- Faza Viktor, plast brez keramike: epistropheus (1 fr.)
- Faza IzA: 7 fragmentov (razpredelnica 16.2)

Pes predstavlja edino domačo žival v mezolitskih režnjih Viktorjevega spodmola, a so njegovi ostanki redki v celotenem profilu. Še ne v celoti osificiran *epistropheus* iz plasti brez keramike (faza Viktor) je pripadal mlajši živali. Podobno lahko rečemo za *phalanx* II iz režnja 8 (faza IzA), ki smo ga zaradi nezraščene proksimalne epifize z diafizo pripisali šele nekajmesečnemu psu (Silver 1972).

Vulpes vulpes (Linnaeus, 1758)

Gradivo:
- Faza Viktor, plast s keramiko: dens (4); premešano: dens (2), cranium (1 fr.)
- Faza Viktor in IzA: dens (2), mandibula (1 fr.), ulna (1 fr.), metacarpus (2), astragalus, calcaneus, metatarsus
- Faza IzA: 5 fragmentov (razpredelnica 16.2)

Ostanki lisice predstavljajo 3,8-odstotni delež vseh določljivih primerkov. Porazdelitev najdb vzdolž profila

Cremonesi *et al.* 1984; Meluzzi *et al.* 1984; Pohar 1990, Turk *et al.* 1993) and Istria (Miracle *et al.* 2000; 2002) show a similar picture. In none of the aforementioned cases does the share of brown bear exceed five percent, and is often entirely absent from the excavated material. Communities of that time clearly did not often choose to hunt bear, and the occasional specimen taken may also have been the result of defensive activity (Bartosiewicz 1999).

Family: Dogs (Canidae)

Canis familiaris Linnaeus, 1758

Material:
- Viktor phase, layer without pottery: epistropheus (1 fr.)
- IzA phase: 7 fragments (Table 16.2)

Dog is the only domestic animal in the Mesolithic spits of Viktorjev spodmol, and its remains are rare in the entire profile. A not entirely ossified *epistropheus* from the layer without pottery (Viktor phase) belonged to a younger animal. The same could be said of the *phalanx* II from spit 8 (IzA phase), which because of the unfused proximal epiphysis we ascribed to a dog only a few months old (Silver 1972).

Vulpes vulpes (Linnaeus, 1758)

Material:
- Viktor phase, layer with pottery: dens (4); mixed: dens (2), cranium (1 fr.)
- Viktor and IzA phase: dens (2), mandibula (1 fr.), ulna (1 fr.), metacarpus (2), astragalus, calcaneus, metatarsus
- IzA phase: 5 fragments (Table 16.2)

Remains of fox represent 3.8 percent of all identified specimens. The distribution of the finds along the profile (IzA phase) indicates their concentration in Prehistoric spits. A similar pattern of distribution was also found with remains of hare. It is worth mentioning that fox may well have contributed to the accumulation of the latter, since it was probably its most important predator (Kryštufek 1991).

Družina: Marten (Mustelidae)

Mustela putorius Linnaeus, 1758

Material:
- IzA phase: os carpale

(faza IzA) kaže na njihovo koncentracijo v prazgodovinskih režnjih. Podoben vzorec je bil ugotovljen tudi pri ostankih poljskega zajca. Pri tem kaže omeniti, da je k akumulaciji slednjih lahko pomembno prispevala prav lisica, saj je bila ta verjetno njegov najpomembnejši plenilec (Kryštufek 1991).

Družina: Kune (Mustelidae)

Mustela putorius Linnaeus, 1758

Gradivo:
- Faza IzA: os carpale

Karpalna kost iz režnja 4 je edini najdeni ostanek navadnega dihurja. Njegov najpomembnejši plenilec je pes (Kryštufek 1991), tako da tudi v tem primeru njegova prisotnost v Viktorjevem spodmolu ni nujno neposredno povezana s človekom.

Martes ex. gr. *martes/foina*

Gradivo:
- Faza Viktor, plast s keramiko: radius (1 fr.), metapodium (2 fr.)
- Faza Viktor in IzA: dens (3)
- Faza IzA: 6 fragmentov (razpredelnica 16.2)

Ostanki kune zlatice *Martes martes* (Linnaeus, 1758) in kune belice *M. foina* (Erxleben, 1777) predstavljajo skupaj dva odstotka vseh najdb iz Viktorjevega spodmola (razpredelnica 16.1). Ločevanje med navedenima vrstama na osnovi fragmentiranih postkranialnih skeletnih elementov je težavno, zato smo se v našem primeru omejili na determinacijo le do nivoju rodu. Danes najdemo na Krasu samo kuno belico, ki je glede izbire habitata veliko manj izbirčna kot pretežno na gozdove vezana kuna zlatica (Kryštufek 1991).

Meles meles (Linnaeus, 1758)

Gradivo:
- Faza Viktor, plast s keramiko: mandibula (1 fr.), humerus; plast brez keramike: mandibula (1 fr.); premešano: os maxillare (1 fr.), atlas (1 fr.), phalanx II, astragalus (1 fr.), ulna (1 fr.), metacarpus (1 fr.), metapodium (1 fr.)
- Faza Viktor in IzA: dens (3), phalanx II (2)
- Faza IzA: 15 fragmentov (razpredelnica 16.2)

Jazbec je s 5,1-odstotnim deležem najbolje zastopana zverska vrsta v Viktorjevem spodmolu. Ob človeku so k akumulaciji njegovih ostankov lahko prispevali tudi volk

VIKTORJEV SPODMOL

The os carpale from spit 4 is the only find of the remains of European polecat. Dog is its most important predator (Kryštufek 1991), so its presence in Viktorjev spodmol is not necessarily connected with mankind.

Martes ex. gr. *martes/foina*

Material:
- Viktor phase, layer with pottery: radius (1 fr.), metapodium (2 fr.)
- Viktor and IzA phase: dens (3)
- IzA phase: 6 fragments (Table 16.2)

Remains of pine marten *Martes martes* (Linnaeus, 1758) and beech marten *M. foina* (Erxleben, 1777) together represent two percent of all finds from Viktorjev spodmol (Table 16.1). Distinguishing between these two species on the basis of fragmented postcranial skeletal elements is difficult, so we limited ourselves here to determination to the level of genus. Only beech marten is found today on the Kras, being a great deal less particular in terms of choice of habitat than the predominantly forest bound pine marten (Kryštufek 1991).

Meles meles (Linnaeus, 1758)

Material:
- Viktor phase, layer with pottery: mandibula (1 fr.), humerus; layer without pottery: mandibula (1 fr.); mixed: os maxillare (1 fr.), atlas (1 fr.), phalanx II, astragalus (1 fr.), ulna (1 fr.), metacarpus (1 fr.), metapodium (1 fr.)
- Viktor and IzA phase: dens (3), phalanx II (2)
- IzA phase: 15 fragments (Table 16.2)

Badger, with a share of 5.1 percent, is the most represented carnivore species in Viktorjev spodmol. Wolf and lynx in addition to man may have contributed to the accumulation of its remains. Nor can the possibility of deaths in the lair be ignored (Kryštufek 1991). We found no trace of human activity (cuts, chop marks) or carnivore's gnawing on any of the finds. In the dimensions from Table 3, the mandible and humerus from Viktorjev spodmol lie at the lower boundary of the range seen in *M. meles* from the Swiss Neolithic site of Seeberg Burgäschisse-Süd (Boessneck *et al.* 1963).

Lutra lutra (Linnaeus, 1758)

Material:
- Viktor phase, layer without pottery: femur (1 fr.)
- IzA phase: tooth

in ris. Zanemariti ne gre niti možnost pogina v jazbinah (Kryštufek 1991). Na nobeni od najdb nismo našli sledov človekovega delovanja (vrez, zasekanina) oz. zverskih zob. V dimenzijah iz tabele 3 se spodnji čeljustnici in humerus iz Viktorjevega spodmola uvrščajo na spodnjo mejo variacijske širine za vrsto *M. meles* iz švicarskega neolitskega najdišča Seeberg Burgäschisse-Süd (Boessneck *et al.* 1963).

Lutra lutra (Linnaeus, 1758)

Gradivo:

- Faza Viktor, plast brez keramike: femur (1 fr.)
- Faza IzA: dens

Femur vidre iz mezolitske plasti Viktorjevega spodmola je bil že popolnoma osificiran in je tako pripadal domnevno več kot tri leta stari živali (Zeiler 1988). Čeprav nismo našli sledi vrezov, pričakujemo, da so jih lovili predvsem zaradi kožuha, medtem ko naj bi imelo meso šele drugoten pomen (Zeiler 1987).

Družina: Mačke (Felidae)

Felis cf. *silvestris* Schreber, 1777

Gradivo:

- Faza Viktor, plast s keramiko: femur (1 fr.); plast brez keramike: humerus (1 fr.); premešano: dens (2), mandibula (1 fr.), phalanx III

The femur of Otter from the Mesolithic layer of Viktorjev spodmol was completely ossified and thus presumably belonged to an animal more than three years old (Zeiler 1988). Although we did not find traces of cuts, we assume that they were hunted mainly for the pelt and the meat was of secondary importance (Zeiler 1987).

Family: Cats (Felidae)

Felis cf. *silvestris* Schreber, 1777

Material:

- Viktor phase, layer with pottery: femur (1 fr.); layer without pottery: humerus (1 fr.); mixed: dens (2), mandibula (1 fr.), phalanx III
- Viktor and IzA phase: dens, ulna (1 fr.), astragalus, phalanx II, phalanx III
- IzA phase: dens, astragalus

Distinguishing between wild and domestic cat *Felis catus* Linnaeus, 1758, is fairly difficult on the basis of postcranial skeletal elements. The identification of cat remains from Viktorjev spodmol as *F. silvestris* is thus based mainly on the fact that the oldest completely domesticated forms of this species in Europe are only known from the second half of the first millennium BC (Bökönyi 1974; Clutton-Brock 1999). The dimensions of the distal part of the humerus from the Mesolithic layer (Viktor phase), which clearly exceed the values for the species *F. catus* are also in agreement with this.

Razpredelnica 16.3: Dimenzije ostankov jazbeca *Meles meles* iz Viktorjevega spodmola (faza IzA). Z izjemo Vzm2 (=višina spodnje čeljustnice za m2) so dimenzije povzete po Von Drieschevi (1976). Podatki za jazbeca iz najdišča Burgäschisee-Süd so povzeti po Jéquierju (1963). Za identifikacijo okrajšav glej prilogo.

Table 16.3: Dimensions of remains of badger *Meles meles* from Viktorjev spodmol (IzA phase). With the exception of Vzm2 (=height of the mandible behind m2) dimensions are taken from Von Driesch (1976). Data for badger from the site Burgäschisee-Süd are taken from Jéquier (1963). See annex for identification of abbreviations.

Skeletni element Skeletal element	Dimenzija Dimension	Vrednost (mm) Measure (mm)	Burgäschisee-Süd (mm)
mandibula	Vzm2	17	17,7–20,7
	m1L	14,5–16 (n=2)	15,4–17,7
	m1B	7 (n=2)	6,8–8,5
atlas	BFcd	32,5	--
	BFcr	24	--
	H	22	--
	Lad	7,5	--
humerus	BT	20,5–21 (n=2)	--
	Bp	23,5	25,7–29,6
	Bd	31	28–32,7
	GL	98,5	98,0–113,4
	Dp	28	8,7–10,1
phalanx I	Bp	7	
	Bd	5	
	GL	13,5	

- Faza Viktor in IzA: dens, ulna (1 fr.), astragalus, phalanx II, phalanx III
- Faza IzA: dens, astragalus

Ločevanje med divjo in domačo mačko *Felis catus* Linnaeus, 1758, je na osnovi postkranialnega skeleta dokaj težavno. Določitev mačjih ostankov iz Viktorjevega spodmola za *F. silvestris* je tako temeljila predvsem na dejstvu, da so najstarejše povsem udomačene oblike omenjene vrste v Evropi znane šele iz druge polovice prvega tisočletja pred Kristusom (Bökönyi 1974; Clutton-Brock 1999). Skladne s tem so tudi dimenzije distalnega dela humerusa iz mezolitske plasti (faza Viktor), ki očitno presegajo vrednosti za vrsto *F. catus*.

Lynx lynx (Linnaeus, 1758)

Gradivo:
- Faza Viktor, premešano: phalanx II (1 fr.)

Druga prstnica, pridobljena med uvodno fazo sondiranja v Viktorjevem spodmolu (tj. faza Viktor), je edina najdba risa s tega najdišča. O sicer vedno maloštevilnih ostankih te vrste poročajo tudi iz nekaterih drugih sočasnih najdišč s tega območja, npr. Pod Črmukljo pri Šembijah (Pohar 1986) in Želvine jame pri Briščikih na Tržaškem krasu - *Grotta della tartaruga* (Cremonesi 1984). Skromnost najdb žal ne dopušča ocene velikosti takratnih živali, kljub temu pa lahko domnevamo, da te niso dosegale danes živečih risov v Sloveniji. Slednji so namreč potomci šestih osebkov po velikosti izstopajoče karpatske podvrste *L. l. carpathicus* Kratochvil in Šollmann, 1963, ki so jih v Kočevskem Rogu naselili leta 1973 (Kryštufek 1991). Avtohtoni ris je bil namreč pred tem v Sloveniji iztrebljen.

Red: Sodoprsti kopitarji ali parkljarji (Artiodactyla)
Družina: Prašiči ali svinje (Suidae)

Sus ex. gr. *scrofa/domesticus*

Gradivo:
- Faza Viktor, plast s keramiko: cranium (2 fr.), dens (2), mandibula (2 fr.), radius (1 fr.), metacarpus, metapodium (2 fr.), phalanx I, ; plast brez keramike: cranium (1 fr.), os maxillare (3 fr.), dens (4), radius (1 fr.), metacarpus (2), ossa coxae (1 fr.), fibula (1 fr.), astragalus, metapodium (2 fr.), phalanx I, ; premešano: os maxillare (2 fr.), dens (14), radius (1 fr.), ulna (1 fr.), ossa carpalia (2), calcaneus, phalanx I (2 fr.), phalanx III (2)
- Faza Viktor in IzA: mandibula (1 fr.), dens (6), os carpale, metacarpus, os sesamoideum (3), metapodium (1 fr.), phalanx I, Phalanx III (1 fr.)

Lynx lynx (Linnaeus, 1758)

Material:
- Viktor phase, mixed: phalanx II (1 fr.)

The second phalanx obtained during the introductory phase of test excavation at Viktorjev spodmol (Viktor phase), is the only find of lynx from this site. Remains of this species are also reported from some other contemporary sites in this region, e.g., Pod Črmukljo by Šembije (Pohar 1986) and Želvina jama by Briščiki (*Grotta della tartaruga*; Cremonesi 1984) on the Triestine Karst, though they are never numerous. The modesty of the finds unfortunately does not allow an assessment of the size of animals, but it can nevertheless be assumed that they did not achieve the size of animals living today in Slovenia. The latter, namely, are the descendants of six individuals of the large Carpathian sub-species *L. l. carpathicus* Kratochvil and Šollmann, 1963, which were introduced into Kočevski Rog in 1973 (Kryštufek 1991), autochthonous lynx having been previously exterminated in Slovenia.

Order: Even-toed ungulates (Artiodactyla)
Family: Pigs (Suidae)

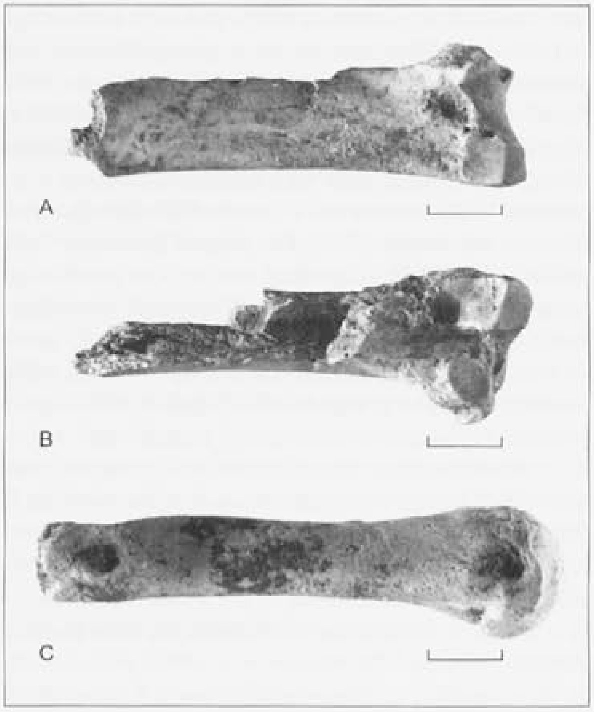
Sus ex. gr. *scrofa/domesticus*

Material:
- Viktor phase, layer with pottery: cranium (2 fr.), dens (2), mandibula (2 fr.), radius (1 fr.), metacarpus, metapodium (2 fr.), phalanx I, ; layer without pottery: cranium (1 fr.), os maxillare (3 fr.), dens (4), radius (1 fr.), metacarpus (2), ossa coxae (1 fr.), fibula (1 fr.), astragalus, metapodium (2 fr.), phalanx I, ; mixed: os maxillare (2 fr.), dens (14), radius (1 fr.), ulna (1 fr.), ossa carpalia (2), calcaneus, phalanx I (2 fr.), phalanx III (2)
- Viktor and IzA phase: mandibula (1 fr.), dens (6), os carpale, metacarpus, os sesamoideum (3), metapodium (1 fr.), phalanx I, phalanx III (1 fr.)
- IzA phase: 76 remains (Table 16.2)

Remains of the genus *Sus* represent approximately one quarter of all finds from Viktorjev spodmol (Table 16.1). Distinguishing between wild boar (*Sus scrofa* Linnaeus, 1758) and domestic pig (*S. domesticus* Erxleben, 1777) only on the basis of bone remains is very difficult (Herre 1972). Differences between the two species in the morphology of skeletal elements are small and limited to elements that are either rare (e.g. canine teeth) or very fragmented (skulls; Bökönyi 1974). In the case of Viktorjev spodmol, we could confirm with certainty the presence of remains of both species in this way (Fig. 16.2), but could not assess the numerical relation bet-

- Faza IzA: 76 ostankov (razpredelnica 16.2)

Ostanki rodu *Sus* predstavljajo približno četrtino vseh najdb iz Viktorjevega spodmola (razpredelnica 16.1). Ločevanje med divjim (*Sus scrofa* Linnaeus, 1758) in domačim (*S. domesticus* Erxleben, 1777) prašičem je le na podlagi kostnih ostankov zelo težavno (Herre 1972). Razlike med obema vrstama v morfologiji skeleta so namreč majhne in omejene na elemente, ki so v arheoloških vzorcih največkrat bodisi redki (npr. podočniki) bodisi zelo fragmentirani (lobanja; Bökönyi 1974). V primeru Viktorjevega spodmola smo sicer na ta način lahko z gotovostjo potrdili prisotnost ostankov obeh vrst (sl. 16.2), ne pa tudi ocenili številčnega razmerja med njima. Za kaj takega so se izkazali kot neprimerni tudi izsledki biometrijske analize izkopanega materiala ter ocena starostne strukture v vzorcu zastopanih osebkov (razpredelnica 16.4; Albarella in Serjeantson 2002). *Metacarpus* III in IV ter *astragalus* iz faze Viktor (plast brez keramike) po dimenzijah lahko v Sloveniji z veliko verjetnostjo pripišemo divjemu prašiču (glej Bökönyi 1995), kar bi lahko rekli tudi o *metacarpus* II iz faze Viktor (plast s keramiko). Gledano v celoti pa je vzorec veliko premajhen, da bi dopuščal oceno obsega prekrivanja med populacijama obeh vrst (Payne in Bull 1988; Bökönyi 1995). Zaradi navedenega naših pričakovanj, da je domači prašič v Viktorjevem spodmolu zastopan le v prazgodovinskih režnjih, tako še ne moremo z gotovostjo potrditi.



Sl. 16.2: Ostanki divjega prašiča *Sus scrofa* iz Viktorjevega spodmola. Legenda: A - metacarpus III (medialno; faza Viktor: plast brez keramike), B - metacarpus IV (medialno; faza Viktor: plast brez keramike), ter C - metacarpus II (lateralno; faza Viktor: plast s keramiko). Merila so podana v cm. Foto M. Grm.

Fig. 16.2: Remains of wild boar *Sus scrofa* from Viktorjev spodmol. Legenda: A - metacarpus III (medial aspect; Viktor phase: layer without pottery), B - metacarpus IV (medial aspect; Viktor phase: layer without pottery), and C - metacarpus II (lateral aspect; Viktor phase: layer with pottery). Measurements are given in cm. Photo M. Grm.

Družina: Jeleni (Cervidae)

Cervus elaphus Linnaeus, 1758

Gradivo:

- Faza Viktor, plast s keramiko: os cornu (4 fr.), dens, mandibula (2 fr.), humerus (2 fr.), ossa metacarpalia (4 fr.), ossa metatarsalia (4 fr.), metapodium (3 fr.), phalanx I (1 fr.); plast brez keramike: os cornu (1 fr.), os maxillare (1 fr.), mandibula (4 fr.), dens, scapula (1 fr.), humerus (2 fr.), ulna (1 fr.), ossa metacarpalia (9 fr.), ossa carpalia (1 fr.), ossa coxae (2 fr.), ossa metatarsalia (3 fr.), metapodium (5 fr.), ossa tarsalia (1), phalanx I (5 fr.), phalanx III (2); premešano: os cornu (2 fr.), dens (3), radius (1 fr.), ossa carpalia (2), ossa metacarpalia (2 fr.), astragalus (3), calcaneus, phalanx I (2 fr.), phalanx II (2 fr.), ossa coxae (1 fr.), ossa metatarsalia (1 fr.), metapodium (1 fr.), ossa sesamoidea (2)
- Faza Viktor in IzA: os cornu (1 fr.), dens, epistropheus, ossa tarsalia (1 fr.), phalanx I (6 fr.)
- Faza IzA: 74 ostankov (razpredelnica 16.2)

Ostanki navadnega jelena predstavljajo največji, skoraj 30-odstotni delež vseh izkopanih kosti in zob v celot-

ween them. The results of biometric analysis of the excavated material and assessment of the age structure in the sample of individuals represented (Table 16.4; Albarella and Serjeantson 2002) also appeared unsuitable. The *metacarpus* III and IV and *astragalus* from the Viktor phase (layer without pottery) in terms of dimensions in Slovenia can be ascribed with great probability to wild boar (*cf.* Bökönyi 1995), which could also be said of the *metacarpus* II from the Viktor phase (layer with pottery). Nevertheless, viewed as a whole, the sample is a great deal too small to allow an assessment of the ratio between the two species (Payne and Bull 1988; Bökönyi 1995). Because of the aforementioned, we cannot with certainty confirm our expectations that domestic pig is represented in Viktorjev spodmol only in the Prehistoric spits.

nem vzorcu (razpredelnica 16.1). Podobno sliko kažejo tudi številna druga mezolitska in prazgodovinska najdišča na Krasu (npr. Riedel 1975; Cremonesi *et al.* 1984; Pohar 1990; Turk *et al.* 1993; Petrucci 1997; Boschin in Riedel 2000) in v Istri (Miracle *et al.* 2000; Miracle 2002), kjer je jelen prav tako najbolje zastopana vrsta (lovnih) velikih sesalcev. V okviru Viktorjevega spodmola so bili ostanki *C. elaphus* pogosti predvsem v mezolitski plasti (faza IzA: režnji 10–19), kjer predstavljajo skoraj polovico vseh najdb. Po drugi strani so v prazgodovinskih režnjih (faza IzA: režnji 1–7) s komaj 10-odstotnim deležem veliko manj številni. Ugotovitev je pričakovana, saj se je v prazgodovini s pojavom živinoreje in poljedelstva pomen lova postopno zmanjševal.

Delež kosti s še nezraščenima epi- in diafizo je zanemarljiv (1,5 %). Merljivih ostankov je premalo, da bi lahko ocenili velikost preteklih populacij; jelen je namreč zelo variabilna vrsta (Kryštufek 1991). Primerjava dimenzij izkopanih primerkov iz Viktorjevega spodmola s tistimi iz švicarskega neolitskega najdišča Seeberg Burgäschisse-Süd (Boessneck *et al.* 1963) pa je pokazala, da so slednji praviloma nekoliko večji. Kolikor je naš vzorec reprezentativen, potem bi lahko sklepali, da mezolitski jeleni po velikosti niso presegali poznejših, prazgodovinskih živali iste vrste. Do podobnih zaključkov je za območje Tržaškega krasa prišel tudi Riedel (1975).

Alces alces (Linnaeus, 1758)

Gradivo:
- Faza IzA: dens

Levi četrti spodnji predmeljak (dolžina: 28 mm; širina 19,5 mm) je edini ostanek losa v vzorcu iz Viktorjevega

Family: Deer (Cervidae)

Cervus elaphus Linnaeus, 1758

Material:
- Viktor phase, layer with pottery: os cornu (4 fr.), dens, mandibula (2 fr.), humerus (2 fr.), ossa metacarpalia (4 fr.), ossa metatarsalia (4 fr.), metapodium (3 fr.), phalanx I (1 fr.); layer without pottery: os cornu (1 fr.), os maxillare (1 fr.), mandibula (4 fr.), dens, scapula (1 fr.), humerus (2 fr.), ulna (1 fr.), ossa metacarpalia (9 fr.), ossa carpalia (1 fr.), ossa coxae (2 fr.), ossa metatarsalia (3 fr.), metapodium (5 fr.), ossa tarsalia (1), phalanx I (5 fr.), phalanx III (2); mixed: os cornu (2 fr.), dens (3), radius (1 fr.), ossa carpalia (2), ossa metacarpalia (2 fr.), astragalus (3), calcaneus, phalanx I (2 fr.), phalanx II (2 fr.), ossa coxae (1 fr.), ossa metatarsalia (1 fr.), metapodium (1 fr.), ossa sesamoidea (2)
- Viktor and IzA phase: os cornu (1 fr.), dens, epistropheus, ossa tarsalia (1 fr.), phalanx I (6 fr.)
- IzA phase: 74 remains (Table 16.2)

Remains of red deer represent the largest, almost 30% share of all excavated bones and teeth in the whole sample (Table 16.1). Numerous other Mesolithic and Prehistoric sites on the Kras (e.g., Riedel 1975; Cremonesi *et al.* 1984; Pohar 1990; Turk *et al.* 1993; Petrucci 1997; Boschin and Riedel 2000) and in Istria (Miracle *et al.* 2000; Miracle 2002) show a similar picture, where red deer is similarly the most represented species of (hunted) large mammal. In the context of Viktorjev spodmol, the remains of *C. elaphus* are frequent above all in the Mesolithic layer (IzA phase: spits 10–19), where they represent almost half of all finds. On the other hand in

Razpredelnica 16.4: Število prašičjih (*Sus* sp.) kosti z (ne)zraščenima epi- in diafizo po starostnih skupinah. Posamezno skupino sestavljajo skeletni elementi, ki popolnoma osificirajo v istem starostnem obdobju. Podatki o obdobju zraščanja epi- in diafiz so povzeti po Silverju (1972).
Table 16.4: Number of domestic pig/wild boar (*Sus* sp.) bones with (un)fused epiphyses by age groups. Individual groups consist of skeletal elements that are completely ossified in the same age period. Data on the period of fusing of epiphyses is taken from Silver (1972).

Doba Period	Starost (v letih) Age (in years)	Epifiza zraščena Epiphysis fused	Epifiza ni zraščena Epiphysis not fused	SKUPAJ TOTAL
PRAZGODOVINA PREHISTORY	0–1	2	--	5
	1–2	1	2	3
	2–3	1	4	5
	3–	--	--	--
	SKUPAJ / TOTAL	4	6	10
MEZOLITIK MESOLITHIC	0–1	6	--	6
	1–2	6	5	11
	2–3	5	6	11
	3–	1	1	2
	SKUPAJ / TOTAL	18	12	30

spodmola (sl. 16.3). Obraba grizalne površine kaže, da je zob pripadal odrasli živali. O izoliranih najdbah losa na Krasu poročajo tudi z mezolitskih najdišč Mala Triglavca pri Divači (Pohar 1990) in Jama na Sedlu pri Šempolaju na Tržaškem krasu - *Grotta Benussi* (Riedel 1975).

Capreolus capreolus (Linnaeus, 1758)

Gradivo:
- Faza Viktor, plast s keramiko: atlas (1 fr.), ossa metatarsalia (1 fr.); plast brez keramike: scapula (1 fr.), ossa coxae (2 fr.); premešano: dens, ossa tarsalia (1), phalanx I (2 fr.)
- Faza Viktor in IzA: metapodium (1 fr.), phalanx I (1 fr.), phalanx III (1 fr.)
- Faza IzA: 10 ostankov (razpredelnica 16.2)

Skupno 21 ostankov srne predstavlja slabe štiri odstotke vseh izkopanih kosti in zob. Pretežni del najdb izhaja iz mezolitskih režnjev, podobno kot to velja tudi za preostali dve pomembni lovni vrsti (jelena, divjega prašiča). Z izjemo metapodija iz faze Viktor in IzA, so bili vsi drugi izkopani fragmenti že popolnoma osificirani.

Družina: Votlorogi (Bovidae)

Ovis s. *Capra*

Gradivo (* - *C. hircus*, ** - *O. aries*):
- Faza Viktor, plast s keramiko: ossa tarsalia (1), humerus (1 fr.**), ossa metacarpalia (1 fr.**), femur (1 fr.**), tibia (1 fr.**); premešano: dens (4), dens (1*)

Sl. 16.3: Levi četrti spodnji predmeljak losa *Alces alces* iz Viktorjevega spodmola (faza IzA: reženj 6). Merilo je podano v cm. Foto M. Grm.
Fig. 16.3: Left fourth lower molar of moose Alces alces from Viktorjev spodmol (IzA phase: spit 6). Measurements are given in cm. Photo M. Grm.

Prehistoric spits (IzA phase: spits 1-7) they are very much less numerous, with a ten percent share. The finding is expected, since in the Prehistoric period the importance of hunting was gradually reduced with the appearance of animal husbandry and arable farming.

The share of bones with unfused epiphyses is negligible (1.5 %). There are too few measurable remains to be able to assess the size of former populations; red deer, namely is a very variable species (Kryštufek 1991). Comparison of the dimensions of the excavated specimens from Viktorjev spodmol with those from the Swiss Neolithic site Seeberg Burgäschisse-Süd (Boessneck *et al.* 1963) indicate that the latter were generally somewhat larger. Insofar as our sample is representative, then we could conclude that Mesolithic deer were not larger than Prehistoric animals of this species. Riedel (1975) came to a similar conclusion for the area of the Triestine Karst.

Alces alces (Linnaeus, 1758)

Material:
- IzA phase: dens

The left fourth lower premolar (length: 28 mm; width 19.5 mm) is the only remains of moose in the sample from Viktorjev spodmol (Fig. 16.3). The worn gnawing surface indicates that the tooth belonged to an adult animal. Isolated finds of moose on the Kras are also reported from Mesolithic sites Mala Triglavca by Divača (Pohar 1990) and Jama na Sedlu by Šempolaj (*Grotta Benussi*; Riedel 1975) on the Triestine Karst.

Capreolus capreolus (Linnaeus, 1758)

Material:
- Viktor phase, layer with pottery: atlas (1 fr.), ossa metatarsalia (1 fr.); layer without pottery: scapula (1 fr.), ossa coxae (2 fr.); mixed: dens, ossa tarsalia (1), phalanx I (2 fr.)
- Viktor and IzA phase: metapodium (1 fr.), phalanx I (1 fr.), phalanx III (1 fr.)
- IzA phase: 10 remains (Table 16.2)

A total of 21 remains of roe deer represent less than four percent of all excavated bones and teeth. The predominant part of finds derive from Mesolithic spits, as also applies for the other two important hunted species (red deer, wild boar). With the exception of the metapodium from the Viktor and IzA phase, all other excavated fragments were completely ossified.

- Faza Viktor in IzA: dens (5), phalanx I (1 fr.)
- Faza IzA: 14 ostankov (razpredelnica 16.2)

Od skupno 31 ostankov, ki smo jih pripisali drobnici, jih je bilo mogoče le osem določiti do nivoja vrste. Tako je bila ovca (*Ovis aries* Linnaeus, 1758) zastopana s šestimi, koza (*Capra hircus* Linnaeus, 1758) pa z dvema najdbama. Skromno število ostankov sicer onemogoča oceno vloge ene in druge vrste v takratni živinoreji. Kaže pa omeniti, da ostanki ovce prevladujejo tudi v drugih prazgodovinskih najdiščih na Krasu (Cremonesi *et al.* 1984; Petrucci 1997; Boschin in Riedel 2000).

V skladu s pričakovanji smo vseh 31 ostankov pobrali bodisi iz prazgodovinskih režnjev bodisi iz sedimenta, kjer so bile najdbe premešane. Na osnovi ocene starostne strukture živali ob zakolu (razpredelnica 16.5) se zdi, da sekundarni produkti reje drobnice niso imeli večjega pomena. Od sicer skupno komaj 15 ustrezno ohranjenih skeletnih elementov jih namreč devet še ni imelo zraščene epi- in diafize. Ker osem od navedenih devetih ostankov pri drobnici popolnoma osificira pri starosti med 12 in 36 mesecev (Moran in O'Connor 1994) lahko upravičeno domnevamo, da so šle te živali v zakol pred dopolnitvijo tretjega leta starosti. Po drugi strani vseh šest fragmentov z že zraščenima epi- in diafizo iz našega vzorca popolnoma osificira preden žival dopolni 24 mesecev starosti, kar zopet dopušča možnost, da so ostanki pripadali živalim, mlajšim od treh let. V kolikor bi bil naš vzorec reprezentativen, bi navedene ugotovitve lahko razumeli kot razmeroma zanesljiv kazalec pretežno v produkcijo mesa usmerjene reje ovc in koz (Jarman 1975; Boschin in Riedel 2000). Edini ustrezno ohranjen spodnji meljak je domnevno pripadal med štiri in osem let stari živali (Payne 1973; 1987)

Bos cf. *primigenius* Bojanus, 1827

Gradivo:
- Faza Viktor, plast brez keramike: dens, phalanx I (2), phalanx III
- Faza IzA: dens

Family: Antelopes, gazelles, cattle, sheep, goats, and relatives (Bovidae)

Ovis s. *Capra*

Material (* - *C. hircus*, ** - *O. aries*):
- Viktor phase, layer with pottery: ossa tarsalia (1), humerus (1 fr.**), ossa metacarpalia (1 fr.**), femur (1 fr.**), tibia (1 fr.**); mixed: dens (4), dens (1*)
- Viktor and IzA phase: dens (5), phalanx I (1 fr.)
- IzA phase: 14 remains (Table 16.2)

Of a total of 31 remains that can be ascribed to ovicaprines, it was only possible to ascribe a species to eight. So sheep (*Ovis aries* Linnaeus, 1758) are represented with six and goat (*Capra hircus* Linnaeus, 1758) with two finds. The modest number of remains do not allow an evaluation of the role of either species in then animal husbandry. It is worth mentioning that the remains of sheep also predominate in other Prehistoric sites on the Kras (Cremonesi *et al.* 1984; Petrucci 1997; Boschin and Riedel 2000).

In line with expectations, we collected all 31 remains either from Prehistoric spits or from sediments where the finds had been mixed. On the basis of an assessment of the age structure of animals at death (Table 16.5) it appears that secondary products of rearing ovicaprines did not have major importance. Of a total of barely 15 suitably preserved skeletal elements, namely, nine did not have fused epiphyses. Since in ovicaprines eight of the nine aforementioned remains completely ossify at an age between 12 and 36 months (Moran in O'Connor 1994) we can justifiably assume that these animals were killed before the age of three years. On the other hand all the skeletal elements represented in this sample with fragments having epiphyses fused with diaphyses (N=6), tend to ossify completely before the animal is 24 month old. The latter again allows the possibility that the remains belonged to animals younger than three years. Insofar as our sample is representative, the aforementioned finding could be understood as a relati-

Razpredelnica 16.5: Število ostankov drobnice (*Ovis* s. *Capra*) z (ne)zraščenima epi- in diafizo po starostnih skupinah. Posamezno skupino sestavljajo skeletni elementi, ki popolnoma osificirajo v istem starostnem obdobju. Podatki o obdobju zraščanja epi- in diafiz so povzeti po Moran in O'Connor (1994).
Table 16.5: Number of remains of ovicaprines (*Ovis* s. *Capra*) with (un)fused epiphyses by age groups. Individual groups consist of skeletal elements that are completely ossified in the same age period. Data on the period of fusing of the epiphyses are taken from Moran and O'Connor (1994).

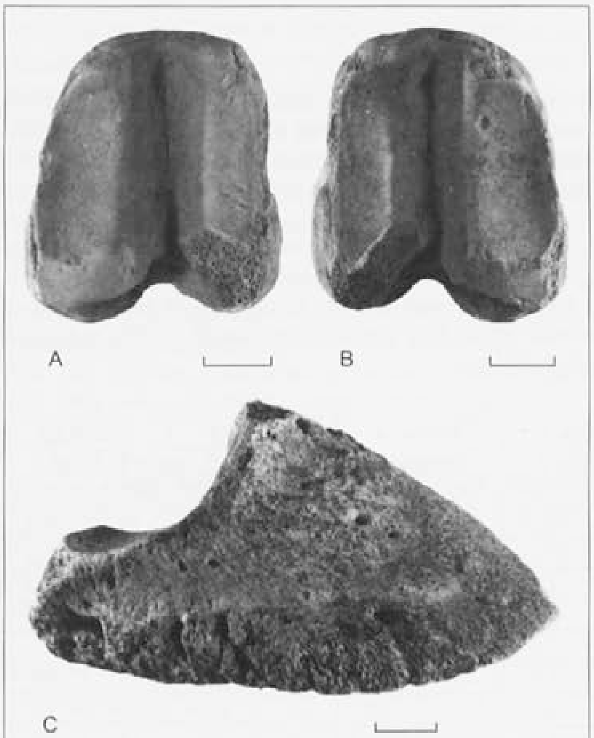
Starost (v letih) Age (in years)	Epifiza zraščena Epiphysis fused	Epifiza ni zraščena Epiphysis not fused	SKUPAJ TOTAL
0–1	--	1	1
1–2	5	5	10
2–3	3	--	3
3–	1	--	1
SKUPAJ / TOTAL	9	6	15

Dva zoba in tri prstnice iz Viktorjevega spodmola po vsej verjetnosti pripadajo pragovedu (sl. 16.4). Do takšnega sklepa smo prišli na osnovi dimenzij navedenih fragmentov (priloga), ki se uvrščajo znotraj variacijske širine za neolitskodobna pragoveda iz Švice in Danske (Payne 1972a). Posamezni ostanki te vrste so znani tudi iz dveh najdišč pri Divači, oddaljenih le nekaj kilometrov od Viktorjevega spodmola, namreč iz Male Triglavce (mezolitik; Pohar 1990) in Trhlovce (prazgodovina; Turk, neobjavljeno) ter tudi iz Istre (Miracle 2000).

Bos taurus Linnaeus, 1758

Gradivo:
- Faza Viktor, plast s keramiko: mandibula (1 fr.), epistropheus (1 fr.), vertebae cervicales (1 fr.), ossa coxae (1 fr.), phalanx I (1 fr.), phalanx II (1 fr.); premešano: dens (1 fr.), astragalus, phalanx III
- Faza IzA: dens

Domačemu govedu smo skupno pripisali le 11 (1,9 %)



Sl. 16.4: Phalanx I (proksimalna sklepna površina; A in B) ter phalanx III (lateralno; C) iz Viktorjevega spodmola, ki domnevno pripadata turu *Bos primigenius*. Material je bil pobran med fazo Viktor v plasti brez keramike. Merila so podana v cm. Foto M. Grm.
Fig. 16.4: Phalanx I (proximal aspect; A and B) and phalanx III (lateral aspect; C) from Viktorjev spodmol, presumed to belong to aurochs *Bos primigenius*. Material was collected during the Viktor phase in the layer without pottery. Measurements are given in cm. Foto M. Grm.

vely reliable indicator of the rearing of sheep and goats being oriented to the production of meat (Jarman 1975; Boschin and Riedel 2000). The only adequately preserved lower molar is presumed to have belonged to an animal between four and eight years (Payne 1973; 1987).

Bos cf. *primigenius* Bojanus, 1827

Material:
- Viktor phase, layer without pottery: dens, phalanx I (2), phalanx III
- IzA phase: dens

Two teeth and three phalanges from Viktorjev spodmol in all likelihood belong to aurochs (Fig. 16.4). We came to such a conclusion on the basis of the dimensions of the aforementioned fragments (annex) which lie within the range of Neolithic aurochs from Switzerland and Denmark (Payne 1972a). Individual remains of this species are also known from two sites by Divača, only a few kilometres from Viktorjev spodmol, namely Mala Triglavca (Mesolithic; Pohar 1990) and Trhlovca (Prehistoric; Turk, unpublished) and also from Istria (Miracle 2000).

Bos taurus Linnaeus, 1758

Material:
- Viktor phase, layer with pottery: mandibula (1 fr.), epistropheus (1 fr.), vertebae cervicales (1 fr.), ossa coxae (1 fr.), phalanx I (1 fr.), phalanx II (1 fr.); mixed: dens (1 fr.), astragalus, phalanx III
- IzA phase: dens

Only 11 (1.9 %) finds were ascribed to domesticated cattle. The remains were collected either from Prehistoric spits or from sediments in which finds were mixed. Similar low shares of bones and teeth of this species are also reported from other contemporary sites on the Kras (Riedel 1975; Turk *et al.* 1992; Turk *et al.* 1993; Petrucci 1997; Boschin and Riedel 2000). The finding is also entirely in agreement with the thesis that sheep and goats were the main animals reared in this region from the Neolithic onwards.

16.2 Discussion

The main problems with which we were confronted in an attempt to interpret the excavated remains of large mammals from Viktorjev spodmol, were the modest number of finds and relatively small area on which they were collected. Both, of course, are negatively reflected on the representative nature of the sample, which also najdb. Ostanki so bili pobrani bodisi iz prazgodovinskih režnjev bodisi iz sedimenta, kjer so bile najdbe premešane. O podobno nizkih deležih kosti in zob te vrste poročajo tudi iz drugih sočasnih najdišč na Krasu (Riedel 1975; Turk *et al.* 1992; Turk *et al.* 1993; Petrucci 1997; Boschin in Riedel 2000). Ugotovitev je navsezadnje povsem v skladu s tezo, da sta bili na tem območju od neolitika naprej poglavitni živinorejski panogi ovčereja in kozjereja.

16.2 RAZPRAVA

Poglavitna problema, s katerima smo se srečevali pri poskusu interpretacije izkopanih ostankov velikih sesalcev iz Viktorjevega spodmola, sta bila skromno število najdb in relativno majhna površina, s katere so bile te pobrane. Oboje seveda negativno odseva v reprezentativnosti vzorca, kar postavlja pod vprašaj tudi posamezne v tem prispevku ponudene interpretacije. Ujemanje naših ugotovitev z ugotovitvami raziskovalcev z različnih drugih sočasnih najdišč slovenskega in tržaškega krasa sicer poveča njihovo težo, vendar pa pri tem ne

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raises a question about individual interpretations offered in this contribution. The correspondence of our findings with the findings of researchers of various other contemporary sits of the Slovene and Triestine Karst increase their weight, but the difficulties connected with the use of dissimilar techniques and methods of excavation should not be overlooked. Methods of obtaining samples that are not comparable, namely are incompatable.

Much the same could be said of the material itself from Viktorjev spodmol, since it was collected with the use of various techniques and methods of excavation. The fairly diverse data on the numerical status of individual species (Table 16.6 and Fig. 16.5) already draws attention to the trap of unifying samples obtained during various phases of test excavation. So, e.g., the share of red deer remains in the Prehistoric sedimentat of Viktor phase is almost 34% while remains of the same animal in the Prehistoric spits of IzA phase are only 9 percent of all finds. In assessing the relative frequency of individual taxa, we therefore used exclusively data from the IzA phase (Table 16.7). Only the latter, namely, is distinguished by the use of exact techniques and methods of excavation, including wet sieving.

Razpredelnica 16.6: Število določenih primerkov (NISP) v Viktorjevem spodmolu zastopanih taksonov velikih sesalcev, pridobljenih med posamezno fazo izkopavanj. Identifikacija simbolov: vzorec 1 - faza Viktor (plast s keramiko), vzorec 2 - faza Viktor (plast brez keramike), vzorec 3 - faza Viktor in IzA (ponovno pregledan nestratificiran sediment iz faze Viktor), vzorec 4 - faza Viktor in IzA (pobrano s sit s premerom luknjic 10 mm) ter vzorec 5 - faza Viktor in IzA (pobrano s sit s premerom luknjic 3 mm). Za obrazložitev glej besedilo.

Table 16.6: Number of identified specimens (NISP) of individual taxa of large mammals represented in Viktorjev spodmol, obtained during individual phases of excavation. Identification of symbols: sample 1 - Viktor phase (layer with pottery), sample 2 - Viktor phase (layer without pottery), sample 3 - Viktor and IzA phase (re-examination of unstratified sediments from Viktor phase), sample 4 - Viktor and IzA phase (collected on sieves with 10 mm hole diameter) and sample 5 - Viktor and IzA phase (collected on sieves with 3 mm hole diameter). See text for explanation.

Takson Taxon	Vzorec 1 Sample 1		Vzorec 2 Sample 2		Vzorec 3 Sample 3		Vzorec 4 Sample 4		Vzorec 5 Sample 5		SKUPAJ TOTAL	
	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP
C. elaphus	21	33,9	39	57,2	24	26,1	9	28,1	1	1,7	94	30,1
Sus sp.	12	19,3	17	25,2	27	29,3	4	12,5	11	18,6	71	22,7
L. europaeus	7	11,3			8	8,7	5	15,6	25	42,3	45	14,4
V. vulpes	5	8,1			3	3,3	7	21,9	2	3,4	17	5,4
M.meles	2	3,2	1	1,5	7	8,7			5	8,5	15	5,1
C.capreolus	2	3,2	3	4,3	3	3,3	2	6,2	1	1,7	11	3,5
Felis sp.	1	1,6	1	1,5	4	4,3	1	3,3	4	6,8	11	3,5
Ovis s. *Capra*	1	1,6			4	4,3	2	6,2	4	6,8	11	3,5
O. aries	4	6,5									4	1,3
C. hircus	1	1,6			1	1,1					2	0,6
B. taurus	6	9,7			4	4,3					10	3,2
Bos cf. *primigenius*			4	5,8							4	1,3
U. arctos			1	1,5	2	2,2	2	6,2	3	5,1	8	2,6
Martes sp.					3	3,3			3	5,1	6	1,9
C. familiaris			1	1,5							1	0,3
L. lynx					1	1,1					1	0,3
L. lutra			1	1,5							1	0,3
SKUPAJ / TOTAL	62	100	68	100	91	100	32	100	59	100	312	100

gre spregledati težav povezanih z uporabo neenakih tehnik in metod izkopavanj. Na neprimerljiv način pridobljeni vzorci namreč niso združljivi.

Podobno bi lahko trdili tudi o samem materialu iz Viktorjevega spodmola, saj je bil zbran z uporabo različnih tehnik in metod izkopavanj. Na pasti pri združevanju vzorcev, pridobljenih med različnimi fazami sondiranja, opozarjajo že dokaj različni podatki o številčnosti posameznih vrst (razpredelnica 16.6 in sl. 16.5). Tako npr. delež jelenjih ostankov v prazgodovinskem sedimentu faze Viktor dosega skoraj 34 odstotkov, medtem ko predstavljajo ostanki iste živali v prazgodovinskih režnjih faze IzA le devet odstotkov vseh najdb. Pri oceni relativnih frekvenc posameznih taksonov smo v tem prispevku tako uporabili izključno podatke iz faze IzA (razpredelnica 16.7). Le slednjo namreč odlikuje uporaba natančnih tehnik in metod izkopavanj, vključno s spiranjem sedimentov.

Bolj kot pogostnost najdb posameznih taksonov v celotnem vzorcu so izpovedni ločeni podatki za prazgodovinsko in mezolitsko skupino režnjev. V ta namen je bilo najprej treba določiti mejo med obema sklopoma, kar pa ni bilo preprosto. Na osnovi arheoloških najdb je I. Turk (ta zbornik) ugotovil, da bi jo bilo smiselno postaviti nekje znotraj skupine režnjev od šest do deset, pri čemer je slednji že zagotovo "mezolitski". Po drugi strani postavlja slika, ki jo kažejo ostanki malih sesalcev, ločnico med izkopa sedem in osem (Toškan in Kryštufek, ta zbornik). V našem primeru smo se tako odločili, da prištejemo k prazgodovinskim vse tiste najdbe, ki so bile pobrane iz zgornjih sedmih, k mezolitskim pa vse

Separate data for Prehistoric and Mesolithic groups of spits are more informative than the frequency of finds of individual taxa in the whole sample. For this purpose, it was first necessary to determine the boundary between the two complexes, which was not simple. On the basis of the archaeological finds, I. Turk (this volume) established that it could sensibly be put somewhere within the group of spits from six to nine, whereby the latter is already certainly "Mesolithic". On the other hand, the picture shown by the remains of small mammals puts the division between spits seven and eight (Toškan and Kryštufek, this volume). We decided to consider Prehistoric all those finds from spit seven upwards and Mesolithic all those collected from below spit nine. Bones and teeth from the "disputed" spits eight and nine were thus excluded from the analysis.

The high share of remains of red deer (44 %) and wild boar (38 %) in spits 10-19 confirms the major importance of hunting for Mesolithic communities of this region (Fig. 16.5a). Many other contemporary sites on the Kras (e.g., Riedel 1975; Cremonesi *et al.* 1984; Pohar 1990; Boschin and Riedel 2000) and in Istria (Miracle *et al.* 2000; Miracle 2002) show a similar expected picture. In all the aforementioned cases, the remains of red deer are far the most numerous, while wild boar and roe deer alternate in second and third place. Of domestic animals, only dog was represented in Mesolithic spits, although it must be remembered that reliably distinguishing between wild and domestic pig was often not possible. However, data on the remains of domestic ani-

Razpredelnica 16.7: Število določenih primerkov (NISP) v Viktorjevem spodmolu zastopanih taksonov velikih sesalcev po režnjih. Podatki se nanašajo izključno na ostanke iz faze IzA.
Table 16.7: Number of identified specimens (NISP) of individual taxa of large mammals represented in Viktorjev spodmol, by spits. Data refers exclusively to remains from phase IzA.

Takson \ Reženj Taxon \ Spit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	SKUPAJ TOTAL
L. europaeus	2	5	13	10	14	6	2	1	2	1	1						1			58
M. meles		1	1	1	1	1		1	1	1		3		1	2			1		15
M. putorius				1																1
Martes sp.	2	1							1					1	1					6
L. lutra									1											1
V. vulpes	1		1	1	1						1									5
C. familiaris				1	1		2	1				2								7
U. arctos												1								1
Felis sp.				1		1														2
Sus sp.	2	3	6	1	4	2		4	4	2	7	1	14	10	11	4	1			76
C. elaphus		1	1	1	5	1		1	6	9	10	9	15	9	5		1			74
C. capreolus	1						1	1	2	1			1	2		1				10
A. alces						1														1
Ovis s. *Capra*	1	2		4	4	1														12
O. aries			1		1															2
B. taurus	1																			1
Bos sp.												1								1
SKUPAJ / TOTAL	10	13	23	21	31	13	5	9	17	14	19	17	30	23	19	5	3	1	0	273

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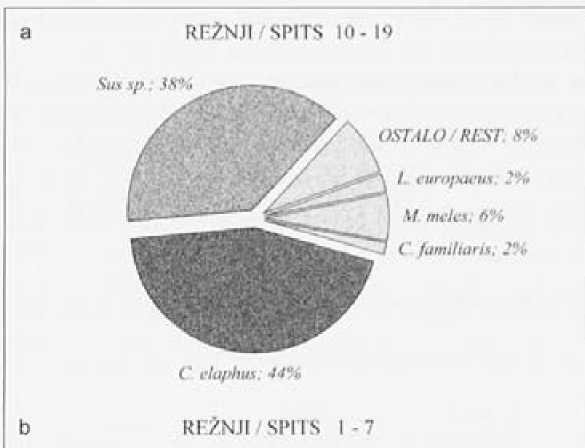
tiste, ki so bile pobrane iz spodnjih desetih režnjev. Kosti in zobe iz "spornih" izkopov osem in devet smo torej izključili iz analize.

Visoka deleža ostankov jelena (44 %) ter divjega prašiča (38 %) v režnjevih 10–19 potrjujeta velik pomen lova za mezolitske skupnosti tega območja (sl. 16.5a). Podobno pričakovano sliko kažejo tudi mnoga druga sočasna najdišča na Krasu (npr. Riedel 1975; Cremonesi *et al.* 1984; Pohar 1990; Boschin in Riedel 2000) in v Istri (Miracle *et al.* 2000; Miracle 2002). V vseh navedenih primerih so namreč daleč najštevilčnejši prav ostanki jelena, medtem ko se na drugem in tretjem mestu izmenjujeta divji prašič in srna. Od domačih živali je bil v mezolitskih režnjih zastopan le pes, čeprav je treba spomniti, da zanesljivo ločevanje med divjim in domačim prašičem pogosto ni bilo mogoče. Sicer pa so podatki o ostankih domačih živali (z izjemo psa) razmeroma maloštevilni tudi v mezolitskih plasteh drugih sočasnih najdišč s Krasa in Istre, pa še ti so praviloma omejeni na obdobje prehoda iz mezolitika v neolitik. To pa seveda dopušča tudi možnost kontaminacije oz. vprašljive časovne umestitve najdb (npr. Riedel 1975).



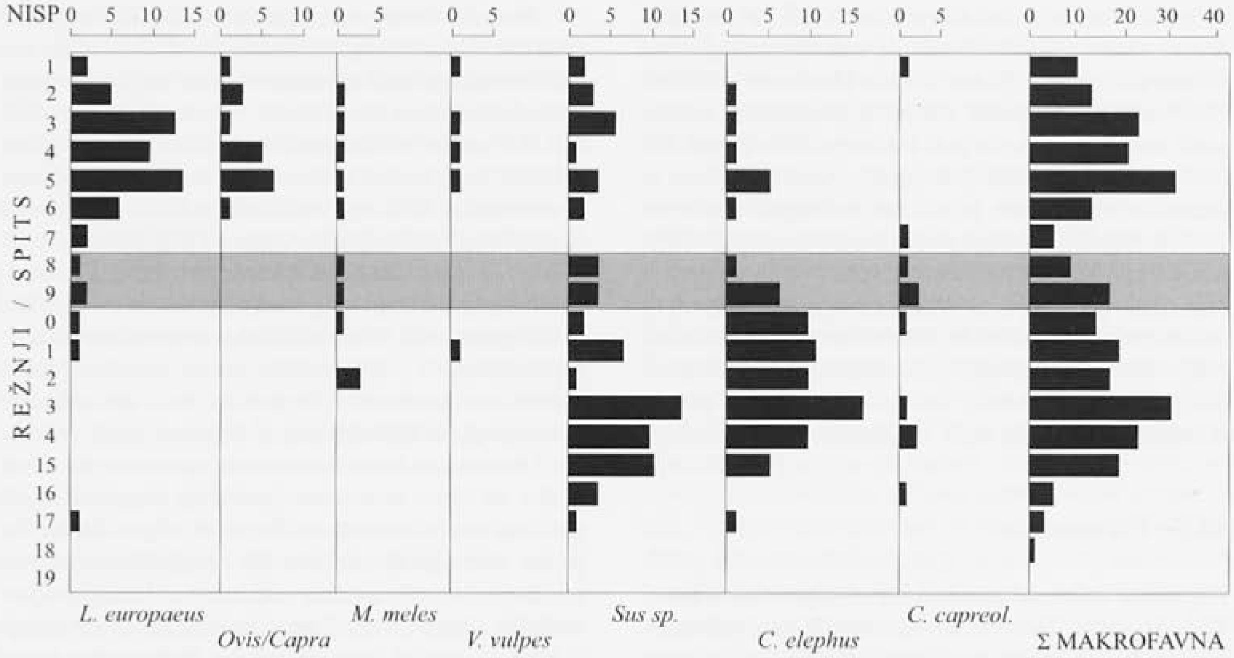
Sl. 16.5a, b: Relativna frekvenca ostankov (% NISP) posameznih v Viktorjevem spodmolu zastopanih taksonov velikih sesalcev. Podatki se nanašajo izključno na ostanke iz faze IzA: režnji 10–19 (a) in 1–7 (b).

Fig. 16.5a, b: Relative frequency of remains (% NISP) of individual taxa of large mammals represented in Viktorjev spodmol. Data refer exclusively to remains from the IzA phase: spits 10–19 (a) and 1–7 (b).

mals (with the exception of dog) are relatively small in number also in Mesolithic layers of other contemporary sites on the Kras and in Istria, and they are generally limited to the period of transition from the Mesolithic to the Neolithic. This also, of course, allows the possibility of contamination or dubious temporal setting of finds (e.g., Riedel 1975).

The picture shown by the remains of large mammals from spits one to seven is essentially different. Above all, the undisputed presence of remains of domestic animals (ovicaprines, cattle) must be mentioned, and the share of the previously predominant red deer is clearly smaller (by 35%). Rather less extensive is the fall in numbers of the remains of the genus *Sus*, which can be ascribed to the fact that a significant share of finds of the abovementioned genus in the Prehistoric sample can certainly be ascribed to domestic pig. Despite the suspicion that hunting was still relatively important long after the end of the Mesolithic (Chapman and Müller 1990), the main differences established between the Castelnovian and Prehistoric samples can certainly be ascribed to the increased importance of livestock rearing and arable farming. Perhaps we can also explain in this light the exceptional increase in the number of excavated remains of hare (Fig. 16.5b). Regardless of whether the main factor of their accumulation in Viktorjev spodmol was man or some carnivore (e.g., fox, wild cat), such a clear jump is very probably an indicator of specific changes in the palaeo-environment: i.e., a spread of open habitats as a result of arable farming and the rearing of ovicaprines. A number of palinological analyses (e.g., Culiberg 1995; Šercelj 1996; Andrič 2002) point in this direction, and Toškan and Kryštufek (this volume) came to a similar conclusion about the palaeoenvironment on the basis of remains of small mammals from Viktorjev spodmol.

The use of percentages for expressing quantitative relations between remains of individual taxa in the sample is a generally used method in zooarchaeology, but it conceals major traps. So, e.g., the appearance of remains of new species inevitably causes a reduction of the share of those already present, although their absolute numbers actually remain unchanged (*cf.* Payne 1972a). Taking such "phantom" changes into account in the shares of individual species, can of course lead to very wrong conclusions. In order that this should not happen in our case, we also compared the Mesolithic and Prehistoric samples from the IzA phase in absolute number of remains of individual taxa (NISP). As is clear from Fig. 16.6, the results entirely confirm the findings already presented: the absence of domestic animals (except dog) from Mesolithic spits and a fall in numbers of finds of hunted game (red deer, wild boar, roe deer) with the arrival the Prehistoric period. There is also a clear leap in the numbers of remains of hare in the upper seven spits.



Sl. 16.6: Število določenih fragmentov (NISP) nekaterih taksonov velikih sesalcev v Viktorjevem spodmolu, po režnjih. Podatki se nanašajo izključno na ostanke iz faze IzA.

Fig. 16.6: Number of individual fragments (NISP) of certain taxa of large mammals in Viktorjev spodmol, by spits. Data refer exclusively to remains from the IzA phase.

Slika, ki jo kažejo ostanki velikih sesalcev iz režnjev ena do sedem je bistveno drugačna. Predvsem moramo omeniti nesporno prisotnost ostankov domačih živali (drobnica, govedo), očitno manjši pa je tudi delež prej vodilnega jelena (za kar 35 %). Nekoliko manj obsežen je upad številčnosti ostankov rodu *Sus*, kar lahko pripišemo dejstvu, da gre v prazgodovinskem vzorcu pomemben delež prašičjih najdb zagotovo pripisati domačemu prašiču. Kljub domnevi, da je bil na Krasu lov razmeroma pomemben še dolgo po koncu mezolitika (Chapman in Müller 1990), lahko pretežni del ugotovljenih razlik med kastelnovjenskim in prazgodovinskim vzorcem pripišemo prav povečanemu pomenu živinoreje in poljedelstva. Morda lahko v tej luči razložimo tudi izjemno povečanje števila izkopanih ostankov zajca (sl. 16.5b). Ne glede na to, ali je bil poglavitni dejavnik njihove akumulacije v Viktorjevem spodmolu človek ali pa kaka zver (npr. lisica, divja mačka), je namreč tako očiten skok zelo verjeten kazalec določenih sprememb v paleookolju: tj. širjenje odprtih habitatov kot posledica poljedelstva in reje drobnice. V to smer kaže več palinoloških analiz (npr. Culiberg 1995; Šercelj 1996; Andrič 2002), podobne ocene paleookolja pa sta na osnovi ostankov malih sesalcev iz Viktorjevega spodmola oblikovala tudi Toškan in Kryštufek (ta zbornik).

Uporaba odstotkov za izražanje kvantitativnih razmerij med ostanki posameznih taksonov v vzorcu je danes v zooarheologiji splošno uporabljena metoda, ki pa skriva veliko pasti. Tako npr. pojav ostankov nove vrste

16.3 Taphonomy

The main factor of accumulation of animal remains in Viktorjev spodmol was certainly man. By means of taphonomic analysis we thus tried among other things to interpret the reasons for people using the overhang cave at that time. For that purpose, we established the relative frequency of appearance of various groups of skeletal elements in the excavated material, whereby we took into account exclusively the remains of ungulates (Suidae, Cervidae, Bovidae) from the IzA phase. We determined the following groups: horns/antlers, teeth, skull (including *cranium, os maxillare, mandibula*), *ossa coxae*, upper parts of the foreleg (*scapula, humerus, radius, ulna*), lower parts of the foreleg (*ossa carpalia, ossa metacarpalia*), upper parts of the rear leg (*femur, patella, tibia, fibula*), lower part of the rear leg (*astragalus, calcaneus, ossa metatarsalia*) and *phalanges*. We did not include in our analysis parts of the back and neck, which are often mentioned in the literature, since we did not identify vertebrae (except *atlas* and *epistropheus*). As is clear from Fig. 7, teeth and phalanges were most numerous in the sample, remains from the meatiest parts of the body (*ossa coxae*, upper parts of front and rear legs) were relatively rare. We also found a fair number of red deer antler in Mesolithic spits (above 15 % NISP), while in the examined Prehistoric sediments they were not present at all. Nevertheless, viewed overall, differences between the two sub-samples were not statistically significant (α=0.05).

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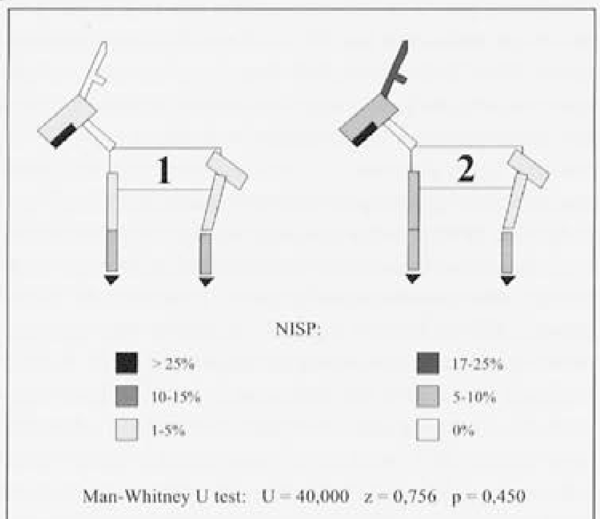
neogibno povzroči zmanjšanje deleža tistih že prisotnih, čeprav ostaja njihova absolutna številčnost dejansko nespremenjena (glej Payne 1972a). Upoštevanje takšnih "fantomskih" sprememb v deležih posameznih vrst pa lahko seveda privede do tudi zelo napačnih sklepov. Da se to v našem primeru ne bi zgodilo, smo mezolitski in prazgodovinski vzorec iz faze IzA primerjali tudi v absolutnem številu ostankov posameznih taksonov (NISP). Kot je razvidno iz slike 16.6 rezultati v celoti potrjujejo že predstavljene ugotovitve: odsotnost domačih živali (z izjemo psa) iz mezolitskih režnjev ter upad številčnosti najdb lovnih živali (jelen, divja svinja, srna) z nastopom prazgodovinskih obdobij. Razviden je tudi skok v številu ostankov poljskega zajca v zgornjih sedmih režnjih.

16.3 Tafonomija

Poglavitni dejavnik akumulacije živalskih ostankov v Viktorjevem spodmolu je bil zagotovo človek. S tafonomsko analizo smo tako poskušali med drugim razbrati vzrok zadrževanja takratnih ljudi v spodmolu. V ta namen smo ugotavljali relativne frekvence pojavljanja različnih skupin skeletnih elementov v izkopanem materialu, pri čemer smo upoštevali izključno ostanke parkljarjev (Suidae, Cervidae, Bovidae) iz faze IzA. Skupine smo opredelili takole: rogovje, zobje, glava (vključuje *cranium, os maxillare, mandibula*), okolčje (*ossa coxae*), zgornji del prednjih nog (*scapula, humerus, radius, ulna*), spodnji del prednjih nog (*ossa carpalia, ossa metacarpalia*), zgornji del zadnjih nog (*femur, patella, tibia, fibula*), spodnji del zadnjih nog (*astragalus, calcaneus, ossa metatarsalia*) ter prsti (*phalanges*). V literaturi sicer večkrat omenjena predela vratu in hrbta v našo analizo nismo vključili, saj vretenc (z izjemo atlasa in epistropheusa) nismo določevali. Kot je razvidno iz slike 7, so bili v našem vzorcu najštevilčnejši zobje in prstnice, razmeroma redki pa so bili ostanki iz sicer najbolj mesnatih delov telesa (okolčje, zgornji deli prednjih in zadnjih nog). V mezolitskih režnjih smo našli tudi precej veliko število fragmentov jelenjih rogov (nad 15 % NISP), medtem ko ti v pregledanem prazgodovinskem sedimentu sploh niso bili prisotni. Kljub temu pa gledano v celoti, razlike med obema podvzorcema niso bile statistično značilne (α=0,05).

V izkopanem materialu iz Viktorjevega spodmola (faza IzA) torej prevladujejo ostanki tistih delov živali, ki vsebujejo majhne količine mesa in maščob. Hkrati lahko iz slike 16.7 razberemo, da je število bolj "mesnatih" skeletnih elementov razmeroma nizko. Takšno razmerje med posameznimi skupinami osteodontoloških najdb navadno povezujemo z lovskimi postajami (npr. Martin 1991; Rowley-Conwy 1996; Miracle *et al.* 2000). Vendar pa to ni edina možnost. Majhno število izkopanih dolgih kosti bi lahko pripisali tudi omejeni površini, s katere so bile pobrane najdbe (skupaj komaj 0,3 m^2)

In the material excavated from Viktorjev spodmol (IzA phase) therefore, remains of those parts of an animal containing small amounts of meat and fat predominate. At the same time, it can be seen from Fig. 16.7 that the number of "meatier" skeletal elements is relatively low. Such a ratio between individual groups of osteodontological finds is normally linked to hunting posts (e.g., Martin 1991; Rowley-Conwy 1996; Miracle *et al.* 2000). However, this is not the only possibility. The small number of excavated long bones could also be ascribed to the limited area from which finds were collected (altogether barely 0.3 m^2) and the use of specific skeletal elements as raw material for making tools. We must also take account of the activities of dogs and other carnivores. These could have an essential impact on the distribution of bones in a space, including those on which gnawing marks are not visible at all (Kent 1981). Together with the aforementioned possibilities, it seems sensible to mention another in the case of Viktorjev spodmol: that a large proportion of the long bones have simply been destroyed. Wet sieving the excavated material during the IzA phase, namely, enabled an insight of the average size and weight of bone fragments. In order to obtain a rather better insight into this segment of the taphonomic analysis, we divided the finds into two size classes: fragments from 3 to 10 mm and those above 10 mm. As is evident from Diagram 16.8, remains smaller than 10 mm predominate in terms of number of pieces per spatial unit, in both Mesolithic and in Prehistoric



Sl. 16.7: Pogostnost (% NISP) ostankov posameznih skupin skeletnih elementov v prazgodovinskem (1) in mezolitskem (2) vzorcu iz Viktorjevega spodmola - faza IzA. Opredelitev posameznih skupin skeletnih elementov je podana v besedilu.

Fig. 16.7: Frequency (% NISP) of remains of individual groups of skeletal elements in the Prehistoric (1) and Mesolithic (2) samples from Viktorjev spodmol - IzA phase. Specification of individual groups of skeletal elements is given in the text.

ter uporabi določenih skeletnih elementov kot surovine za izdelavo orodij, upoštevati pa moramo tudi aktivnost psov in drugih zveri. Te namreč lahko bistveno vplivajo na razporeditev kosti v prostoru, tudi tistih, na katerih ostanki zob sicer sploh niso opazni (Kent 1981). Ob navedenih možnostih pa se zdi v primeru Viktorjevega spodmola smiselno omeniti še eno: da je bil namreč velik del dolgih kosti preprosto uničen. Spiranje izkopanega materiala med fazo IzA je namreč omogočalo vpogled v povprečno velikost in maso kostnih fragmentov. Da bi dobili nekoliko boljši vpogled v ta segment tafonomske analize, smo najdbe razdelili v dva velikostna razreda: fragmenti velikosti od 3 do 10 mm ter tisti nad 10 mm. Kot je razvidno iz razpredelnice 16.8, po številu kosov na prostorninsko enoto prevladujejo ostanki, manjši od 10 mm, in to tako v mezolitskem, kot tudi v prazgodovinskem podvzorcu. Pri tem kaže tudi dodati, da se nad pet centimetrov veliki ostanki v izkopanem materialu pojavljajo le sporadično, pri čemer med obema podvzorcema ni statistično značilnih razlik (Mann-Whitneyjev U-test: $p > 0,05$).

Glede na očitno fragmentiranost materiala se je vsekakor smiselno vprašati o dejavnikih, ki so odgovorni za to. S ciljem oceniti vlogo poodložitvenega razpadanja kosti na sedimentu in v njem (glej Von Endt in Ortner 1984) smo tako najprej analizirali ohranjenost kostne substance. Izkazalo se je, da na površini izkopanih kosti praviloma ni zaslediti očitnejših znakov razpadanja, ki bi ga lahko pripisali izpostavljenosti spreminjajočim se mikroklimatskim pogojem. Na osnovi kriterijev, ki jih je za kvantifikacijo navedenih površinskih sprememb na kosti predstavila Behrensmeyerjeva (1978), smo večino najdb namreč uvrstili v stopnjo nič in ena. Zanimal nas je tudi obseg soodvisnosti med pogostnostjo posameznih skeletnih elementov v vzorcu in njihovo strukturno gostoto. V kolikor bi namreč na drobljenje kostnega materiala vplivali predvsem fizikalni in kemični dejavniki v sedimentu, bi bilo med določljivimi fragmenti smiselno pričakovati veliko število ostankov z relativno veliko strukturno gostoto, saj so ti obstojnejši (Lyman 1985; 1999). Analizo smo opravili ločeno za mezolitski (N=102) in prazgodovinski (N=89) vzorec iz faze IzA, pri čemer smo podatke o strukturni gostoti

sub-samples. It is worth adding here that remains larger than 5 centimetres only sporadically appear in excavated material, by which there is no statistically significant difference between the two sub-samples (Mann-Whitney U-test: $p > 0.05$).

In view of the clear fragmentation of the material it certainly makes sense to ask about factors that are responsible for this. In order to assess the role of post-depositional disintegration of bones on the surface and in the sediment (*cf.* Von Endt and Ortner 1984) we thus first analysed the preservation of the bone substances. It appeared that on the surface of excavated bones there is generally no trace of weathering. On the basis of criteria that Behrensmeyer (1978) presented for the quantification of this type of surface changes on bones, we classified the majority of finds at the level of nought or one. We were also interested in the extent of interdependence between the frequency of individual skeletal elements in the sample and their structural density. Insofar as mainly physical and chemical factors in the sediment influenced the crumbling of bone material, it would be sensible to expect among identified fragments a large number of remains with a relatively high structural density, since these are more persistent (Lyman 1985; 1999). We performed analysis separately for the Mesolithic (N=102) and Prehistoric (N=89) sub-samples from the IzA phase, whereby we took data on the structural density of individual skeletal parts from Lyman (1999). We tested the dependence between the frequency of individual skeletal elements in the sample and their structural density with non-parametric statistical measurement of correlation (Spearman's r). The results excluded the existence of strong statistically significant correlations both in the Mesolithic (Spearman's $r = -0.30$; $p > 0.05$) and in the Prehistoric (Spearman's $r = 0.39$; $p < 0.05$) sub-samples.

The value of the Completeness Index (CI), which attempts to assess the influence of abiotic post-depositional factors on the fragmentation of bones by analysis of the completeness of skeletal elements that are unlikely to have been fragmented by man or animals (i.e., *ossa carpalia* and *tarsalia*; Marean 1991), is also in agreement with this. The high value for the whole sample from Vik-

Razpredelnica 16.8: Povprečno število in masa živalskih ostankov na volumensko enoto sedimenta mezolitskih oz. prazgodovinskih režnjev Viktorjevega spodmola (faza IzA). Podatki so podani za ostanke dveh velikostnih razredov: 3–10 mm ter nad 10 mm.

Table 16.8: Average number and weight of animal remains per volumetric unit of sediment of Mesolithic and Prehistoric spits of Viktorjev spodmol (IzA phase). Data are given for the remains of two size classes: 3–10 mm and above 10 mm.

Enota Unit	Vel. razred Size class	Režnji 1–7 Spits 1–7	Režnji 10–19 Spits 10–19	χ^2 test	
N/dm³	3–10 mm	239,3	330,4	} $\chi^2 = 0{,}653$	p>0,884
N/dm³	10– mm	79,7	123,7		
g/dm³	3–10 mm	44,2	85,6	} $\chi^2 = 0{,}036$	p>0,998
g/dm³	10– mm	59,6	116,2		

posameznih skeletnih delov povzeli po Lymanu (1999). Soodvisnost med pogostnostjo posameznih skeletnih elementov v vzorcu in njihovo strukturno gostoto smo testirali z neparametrično statistično mero korelacije (Spearmanov r). Rezultati so izključili obstoj omembe vrednih statistično značilnih korelacij tako v mezolitskem (Spearmanov r = -0,30; p > 0,05) kot tudi prazgodovinskem (Spearmanov r = 0,39; p < 0,05) vzorcu.

Skladna s tem je tudi vrednost indeksa celovitosti (CI; *Completness Index*), ki poskuša oceniti vpliv abiotskih poodložitvenih dejavnikov na drobljenje kosti z analizo celovitosti tistih skeletnih elementov, katerih razbijanje s strani človeka in živali ni verjetno (tj. *ossa carpalia* in *tarsalia*; Marean 1991). Njegovo visoko vrednost za celoten vzorec iz Viktorjevega spodmola (CI=88,5 %) lahko nedvomno razumemo kot dodaten dokaz v prid tezi, da fragmentiranosti kostnega materiala v našem primeru ne gre pripisati poodložitvenim dejavnikom, temveč predvsem načrtnemu delovanju človeka. Ta je z razbijanjem kosti laže prišel do maščob, ki so ostale v njih tudi še po odstranitvi kostnega mozga (npr. Jones in Metcalfe 1988). Zdrobljene epi- in diafize dolgih kosti je lahko uporabil za pripravo nekakšne juhe ali "koščenega soka" (*bone juice*; Rowley-Conwy 1996), preostanek pa tudi kot kurivo. Seveda so bili pri tem bolj zanimivi tisti skeletni elementi, ki vsebujejo več maščobe. To pa se lepo ujema s podatki na sliki 16.7, kjer prevladujejo prav manj "mesnati" ostanki ter ostanki z manjšo vsebnostjo maščob.

Razumljivo je, da je bila odločitev o razbijanju kosti povezana z vračanjem energije, ki ga je to početje obetalo, ter seveda s količino takrat razpoložljive hrane v skupnosti. Tako lahko pričakujemo, da je bilo drobljenje intenzivnejše v obdobjih pomanjkanja hrane oz. kadar je bila energetska vrednost plena manjša (Jones in Metcalfe 1988). Z namenom ugotoviti morebitne tovrstne razlike med ostanki iz mezolitskih in prazgodovinskih režnjev faze IzA smo primerjali povprečno maso fragmentov obeh podvzorcev (razpredelnica 16.9). Izkazalo se je, da večjih razlik med njima sicer ni, so pa

torjev spodmol (CI=88.5 %) can certainly be understood as additional evidence for the thesis that the fragmentation of the bone material in this case cannot be ascribed to post-depositional factors, but mainly to the planned activity of man. By the breaking of the bones, he more easily reached the fat that remained in them even after the removal of the bone marrow (e.g., Jones and Metcalfe 1988). Fragmented epi- and diaphyses of long bones may have been used for the preparation of a soup or "bone juice" (Rowley-Conwy 1996), and the remainder as fuel. Of course, the skeletal elements that contain more fat would be more interesting for this. This is well illustrated by data in Fig. 16.7, in which precisely less "meaty" remains and remains with smaller fat contents predominate.

The decision on the fragmenting of bones is obviously connected with the return of energy that this behaviour provided and, of course, with the quantity of food then available in the community. We can thus expect that such fragmentation would have been more intensive in periods of food shortage or when the energy value of prey was less (Jones and Metcalfe 1988). In order to determine possible such differences between remains from Mesolithic and Prehistoric spits of the IzA phase, we compared the average weight of fragments of the two sub-samples (Table 16.9). It appeared that there is no major difference between them, although fragments from Prehistoric excavations are nevertheless statistically significantly larger (Fig. 16.8). It is therefore worth asking whether the established extent of difference is already such that it would be sensible to interpret it as a result of planned greater or lesser intensity of fragmenting bones. It is doubtful, namely, that the extraction of fat from the on average barely 0.4 g lighter (and thus correspondingly smaller) fragments is essentially more effective.

It can also be concluded from Fig. 16.8 that the burned fragments are within the same size class, being either only slightly smaller (size class above 1 cm) or even somewhat larger (3-10 mm) than those that are

Razpredelnica 16.9: Opisna statistika za povprečno število koščenih fragmentov na režen mezolitskega (r. 10-19) in prazgodovinskega (r. 1-7) podvzorca. Podani sta tudi povprečni masi fragmentov (X). Podatki se nanašajo izključno na ostanke iz faze IzA.

Table 16.9: Descriptive statistics for the average number of bone fragments in spits of the Mesolithic (spits 10-19) and Prehistoric (spits 1-7) sub-samples. The average weights of fragments are also given (X). Data refer exclusively to remains from the IzA phase.

Režnji Spits	Statistike Statistics	Fragmenti 3–10 mm Fragments 3–10 mm		Fragmenti nad 10 mm Fragments over 10 mm		Določljivi fragmenti Determinable fragments	
		N	X	N	X	N	X
1–7 (N=13)	Me	78	0,21	26	1,21	9,5	1,59
	25–75 %	54–88	0,19–0,22	23–27	1,03–1,41	6–12	1,08–2,57
	min–max	26–119	0,16–0,32	15–34	0,90–2,48	1–19	0,30–6,63
10–19 (N=17)	Me	187	0,17	70	0,99	7,5	4,79
	25–75 %	88–215	0,09–0,18	16–84	0,80–1,17	1–12	2,26–7,53
	min–max	33–329	0,05–0,21	4–164	0,23–1,93	0–20	0,11–14,08

fragmenti iz prazgodovinskih izkopov vseeno statistično značilno večji (sl. 16.8). Vredno se je torej vprašati, ali je ugotovljen obseg razlik že tolikšen, da bi ga bilo smiselno interpretirati kot posledico načrtno večje oz. manjše intenzivnosti drobljenja kosti. Obstajajo namreč dvomi o tem, da je ekstrakcija maščobe iz v povprečju komaj 0,4 g lažjega (in torej ustrezno manjšega) fragmenta bistveno učinkovitejša.

Iz slike 16.8 lahko razberemo tudi to, da so ožgani fragmenti znotraj istega velikostnega razreda bodisi le malenkost manjši (razred velikosti nad 1 cm) bodisi celo nekoliko večji (3-10 mm) od tistih neožganih. Ugotovitev je zanimiva ob upoštevanju dejstva, da izpostavljenost visokim temperaturam (ognju) zmanjša trdnost kosti. Tako bi lahko nastanek množice majhnih ožganih drobcev iz našega vzorca pripisali predvsem drobljenju večjih že ožganih fragmentov zaradi delovanja poodložitvenih abiotskih dejavnikov. Navsezadnje ožgane kosti ni mogoče vedno povezovati s pripravo in uživanjem hrane, saj so bili lahko koščeni drobci izpostavljeni ognju tudi pozneje (Stiner in Kuhn 1995). Vendar pa se zdi ob upoštevanju ugotovitev iz slike 16.8 vseeno verjetnejša domneva, da je za nastanek pretežnega dela drobnih ožganih fragmentov odgovoren človek z načrtnim razbijanjem še neožganih kosti, pri čemer naj bi bila izpostavljenost ognju šele sekundarna.

Na koncu je treba omeniti tudi številne kostne fragmente, manjše od 3 mm, ki pripadajo izključno velikim sesalcem. Ti fragmenti so v vseh mezolitskih režnjih. Na podlagi številnih v ognju kalciniranih in ožganih primerkov sklepamo, da so vsaj nekateri kostni drobci, če ne vsi, nastali sinsedimentno. To pomeni, da majhni kostni fragmenti niso nastali izključno s preperevanjem v postsedimentnem obdobju, kot običajno razlagajo, temveč predvsem z namernim drobljenjem kosti.

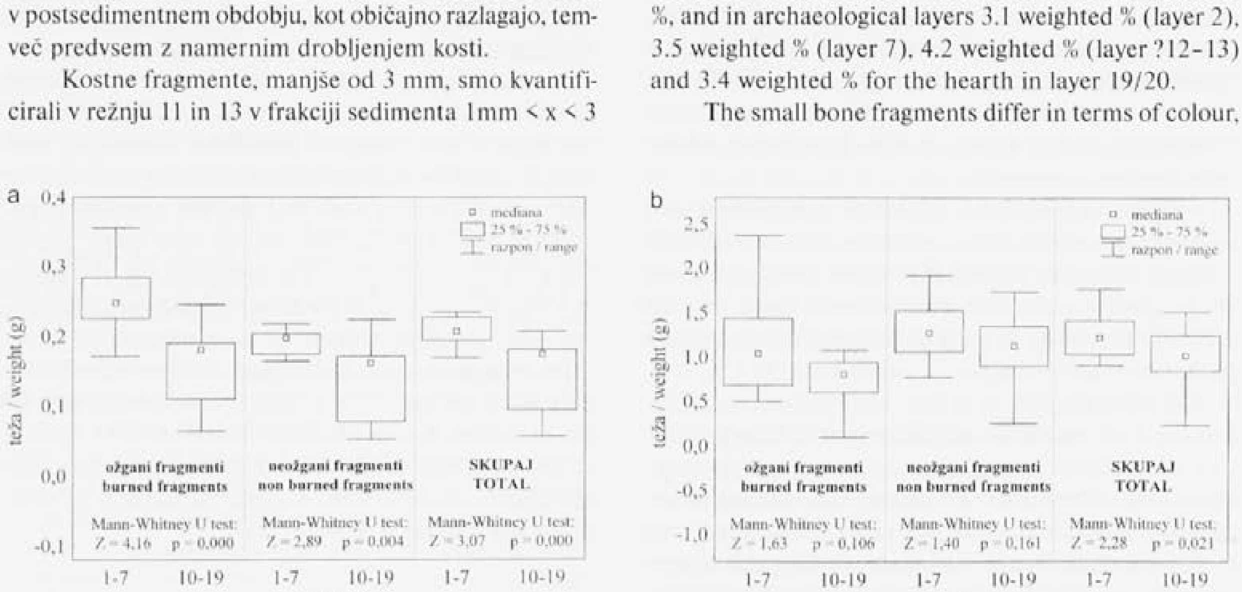
Kostne fragmente, manjše od 3 mm, smo kvantificirali v režnju 11 in 13 v frakciji sedimenta 1mm < x < 3

not burnt. The finding is interesting bearing in mind that exposure to high temperature (fire) reduces the hardness of bones, thus the creation of a mass of small charred fragments from our sample could be ascribed mainly to fragmentation of already burned fragments because of the activity of post-depositional abiotic factors. After all, burned bones cannot always be linked to the preparation and eating of food, but can also be of post-depositional origin (Stiner and Kuhn 1995). However, taking into account the findings from Fig. 16.8, it seems at least more probable to suspect that man was responsible for the creation of the predominant part of the small charred fragments, with the deliberate breaking of still unburned bones, by which exposure to fire would only have been secondary.

It must be stressed at the end also the numerous bone fragments less than 3 mm that belong exclusively to large mammals. These fragments are in all Mesolithic spits. On the basis of the number of specimens calcified and charred in fire, we conclude that at least some of the bone fragments, if not all, were created synsedimentationally. This means that small bone fragments were not created exclusively by weathering in the post-sedimentational period, as is normally interpreted, but mainly by the deliberate breaking of bones.

We quantified bone fragments smaller than 3 mm in spits 11 and 13 in the fraction of sediment 1mm < x < 3 mm. In spit 11, there was 1.2 g or 165 bone fragments (4.1 weighted % or 5.7 b.f./ml) in 29 ml of sediment , and in spit 13 there was 1.1 g or 138 bone fragments (4.4 weighted % or 5.5 b.f./ml). In the Pleistocene layers of Divje babe I the shares of the same bone fragments in archaeologically sterile layers was 2 weighted %, and in archaeological layers 3.1 weighted % (layer 2), 3.5 weighted % (layer 7), 4.2 weighted % (layer ?12-13) and 3.4 weighted % for the hearth in layer 19/20.

The small bone fragments differ in terms of colour,



Sl. 16.8a, b: Povprečna masa ožganih in neožganih fragmentov kosti in zob velikostnega razreda 0,3 do 1 cm (a) oz. nad 1 cm (b).

Fig. 16.8a, b: Average weight of burnt and unburnt fragments of bones and teeth of size class 0.3 to 1 cm (a) or above 1 cm (b).

mm. V režnju 11 je bilo v 29 ml sedimenta 1,2 g ali 165 kostnih drobcev (4,1 téžna % ali 5,7 k.d./ml), v režnju 13 pa je bilo v 25 ml sedimenta 1,1 g ali 138 kostnih drobcev (4,4 téžna % ali 5,5 k.d./ml). V pleistocenskih plasteh Divjih bab I so deleži enakih kostnih drobcev v arheološko sterilnih plasteh 2 téžna %, v arheoloških plasteh pa 3,1 téžna % (plast 2), 3,5 téžna % (plast 7), 4,2 téžna % (plast ?12–13) in 3,4 téžna % za ognjišče v plasti 19/20.

Majhni kostni drobci se razlikujejo po barvi, kar povezujemo z različnimi sedimentnimi mikrookolji. Med njimi so tudi zeleno obarvani. Zaradi suma bakrenega volka smo dva primerka kemično analizirali. Analiza je pokazala, da sum ni bil utemeljen. Kemični elementi so v zeleno obarvanih kosteh zastopani v naslednjem vrstnem redu: Ca, P, Ar, K, Fe, Mn, Zn, Ti in Cu. Analizo je opravil Žiga Šmit (Inštitut Jožefa Stefana, Slovenija), za kar se mu najlepše zahvaljujeva.

16.4 Paleoekonomija

Ocena ekonomske baze preteklih skupnosti iz Viktorjevega spodmola ni mogoča, saj je množina razpoložljivega materiala za kaj takega premajhna. Brez dvoma lahko sicer trdimo, da je bil za mezolitskega človeka lov poglavitni vir živalskih maščob. Prav tako ne gre dvomiti o vodilni vlogi jelena med lovnimi živalmi, ki sta mu sledila še divji prašič in verjetno srna. Tudi to, da so manjše živali (npr. divja mačka, lisica, jazbec, zajec) plenili predvsem zaradi njihovih kožuhov, ne bi smelo biti sporno. Se pa lahko v zvezi s t. i. majhnim plenom upravičeno vprašamo, v kolikšni meri je številčnost najdb sploh smiselno povezovati s človekom. Mnoge od naštetih živali so namreč lahko spodmol in njegovo bližnjo okolico uporabljale kot brlog ali lovišče (npr. Miracle 1997). Na osnovi ostankov velikih sesalcev lahko za zdaj le malo povemo npr. tudi o sezoni, dolžini in namenu zadrževanja človeka v spodmolu.

Vprašanja brez jasnih odgovorov so še številnejša v primeru prazgodovinskega podvzorca. Iz razpoložljivega kostnega materiala namreč ni mogoče zanesljiveje oceniti pomena posameznih vrst domačih živali znotraj takratnih skupnosti, še manj pa namen, s katerim so jih gojili. Na osnovi podatkov iz razpredelnic 16.1 in 16.4 bi sicer lahko sklepali, da je bila takrat najpomembnejša domača žival ovca in da sekundarni produkti reje drobnice za takratne ljudi še niso imeli večjega pomena. Domnevna starost živali ob zakolu je bila namreč v Viktorjevem spodmolu razmeroma nizka, kar kaže na rejo drobnice usmerjeno v produkcijo mesa. Obe tezi se lepo ujemata tudi s podatki iz nekaterih drugih približno sočasnih najdišč s Krasa (npr. Turk *et al.* 1992; Turk *et al.* 1993; Petrucci 1997; Boschin in Riedel 2000). Vendar pa njuna dejanska potrditev brez analiz dodatnega materiala ni mogoča (glej Payne 1972a).

VIKTORJEV SPODMOL

which we associate with various sedimentation microenvironments. They include those coloured green. Because of the suspicion of patinating we analysed two specimens chemically. The analysis showed that the suspicion was not well founded. The chemical elements in the green coloured bones are represented in the following order: Ca, P, Ar, K, Fe, Mn, Zn, Ti and Cu. The analysis was performed by Žiga Šmit (Jožef Štefan Institute, Slovenia), for which we are very grateful.

16.4 Paleoeconomy

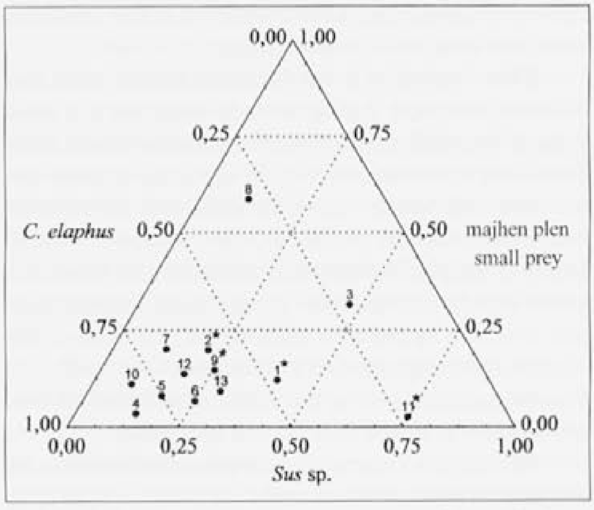
An assessment of the economic base of past communities from Viktorjev spodmol is not possible since the mass of available material is too small for such an assessment. We can, however, undoubtedly state that hunting was the main source of animal meat and fats for Mesolithic man. Similarly, it cannot be doubted that red deer had a leading role in terms of game, followed by wild boar and probably roe deer. That small animals (e.g., wild cat, fox, badger, hare) were hunted mainly for their fur can also not be disputed. In connection with so-called small game, we can justifiably ask to what extent the number of finds can sensibly be linked with mankind at all. Many of the enumerated animals could have used the overhang cave and its immediate surroundings as a lair or hunting ground (e.g. Miracle 1997). On the basis of the remains of large mammals, we can only say little so far about the season, length and purpose of mankind being in the overhang cave.

In the case of the Prehistoric sub-sample, the questions without clear answers are even more numerous. From available bone material, namely, a more reliable assessment of the importance of individual species of domestic animals within the then community cannot be concluded, still less the purpose for which they reared them. On the basis of data from Tables 16.1 and 16.4, it could be concluded that the then most important domestic animal was sheep and that secondary products of rearing ovicaprines did not have major importance for the people then. The presumed age of animals in Viktorjev spodmol at the time of death was relatively low, which indicates the breeding of ovicaprines directed at meat production. Both theses correspond well with data from certain other nearby contemporary sits on the Kras (e.g., Turk *et al.* 1992; Turk *et al.* 1993; Petrucci 1997; Boschin and Riedel 2000). However, they cannot actually be confirmed without the analysis of additional material (*cf.* Payne 1972a).

16.5 Alopatric Comparison

The temporal determination of finds from the upper seven spits of Viktorjev spodmol (IzA phase) is fairly

16.5 Alopatrične primerjave



Sl. 16.9: Deleži (% NISP) ostankov jelena (*Cervus elaphus*), prašiča (*Sus* sp.) in majhnega plena (tj. *Lepus, Mustela, Martes, Meles, Lutra, Felis, Lynx* in *Vulpes*) v paleontoloških vzorcih iz različnih najdišč Krasa in sosednjih regij. Zvezdica (*) označuje najdišča, kjer je bil material pred pregledovanjem spran. Identifikacija simbolov: 1 - Viktorjev spodmol (režnji 10-19), 2 - Pupićina peć pod Učko (N=5.177; Miracle 1997), 3 - Pod Črmukljo pri Šembijah (N=30; Pohar 1986), 4 - Breg-Škofljica pri Ljubljani (N=107; Pohar 1984), 5 - Mala Triglavca pri Divači (N=370; Pohar 1990), 6 - Šebrn Abri pod Učko (N= 521; Miracle *et al.* 2000), 7 - Želvina jama pri Briščikih - *Grotta della tartaruga* (N=130; Cremonesi 1984), 8 - *Grotta Lonza* (N=130; Meluzzi *et al.* 1984), 9 - Pečina na Leskovcu pri Samatorci - *Grotta azzurra* (N=222; Cremonesi *et al.* 1984), 10 - Jama na Sedlu pri Šempolaju - *Grotta Benussi* (N=671; Riedel 1975), 11 - Pečina pri Bjarču v dolini Nadiže - *Riparo di Biarzo* (N=972; Rowley-Conwy 1996), 12 - Stenašca pri Praproti - *Grotta dell'Edera* (N=142; Boschin in Riedel 2000) ter 13 - Riparo Gaban pri Trentu (N=461; Kozlowski in Dalmeri 2002).

Fig. 16.9: Shares (% NISP) of remains of red deer (*Cervus elaphus*), boar (*Sus* sp.) and small game (i.e., *Lepus, Mustela, Martes, Meles, Lutra, Felis, Lynx* and *Vulpes*) in palaeontological samples from various sites on the Kras and neighbouring regions. An asterisk (*) marks a site where the material was sieved before examination. Identification of symbols: 1 - Viktorjev spodmol (spits 10-19), 2 - Pupićina peć below Učka (N=5.177; Miracle 1997), 3 - Pod Črmukljo by Šembije (N=30; Pohar 1986), 4 - Breg-Škofljica by Ljubljana (N=107; Pohar 1984), 5 - Mala Triglavca by Divača (N=370; Pohar 1990), 6 - Šebrn Abri below Učka (N= 521; Miracle *et al.* 2000), 7 - Želvina jama by Briščiki - *Grotta della tartaruga* (N=130; Cremonesi 1984), 8 - *Grotta Lonza* (N=130; Meluzzi *et al.* 1984), 9 - Pečina na Leskovcu by Samatorca - *Grotta azzurra* (N=222; Cremonesi *et al.* 1984), 10 - Jama na Sedlu by Šempolaj - *Grotta Benussi* (N=671; Riedel 1975), 11 - Pečina pri Bjarču in the valley of the Nadiža - *Riparo di Biarzo* (N=972; Rowley-Conway 1996), 12 - Stenašca by Praprot - *Grotta dell'Edera* (N=142; Boschin and Riedel 2000) and 13 - Riparo Gaban by Trento (N=461; Kozlowski and Dalmeri 2002).

loose. We must be aware in this that essential differences exist between different time periods of prehistory, in, e.g., the importance of breeding livestock, their level of development, the (non)exploitation of various secondary products, and not least, also in the role of hunting itself (e.g., Bökönyi 1974). All this is, of course, reflected in the specificity of archaeozoological samples of different periods, which are not therefore completely comparable. Because of this, in this contribution we have limited ourselves in the presentation of a comparison of our findings with those from a number of other contemporary sites in the region exclusively to the temporally satisfactorily placed Mesolithic sample (IzA phase). We are far from thus avoiding all the difficulties. Above all, mention must be made of the problem of different methods and techniques of excavation and sampling used at individual sites. This is potentially a very disruptive factor, which could have an essential impact on the final conclusions (e.g., Payne 1972b). Because of the aforementioned, we also did not state the number of remains of each individual species individually. Instead of this, we preferred to compare the share of red deer and (wild) boar, together with roe deer the then two main hunted animals, with the share of all so-called small game together (*Lepus, Mustela, Martes, Meles, Lutra, Felis, Lynx* and *Vulpes*).

It appeared that the majority of the sites form a uniform group (Fig. 16.9). The Mesolithic sample from Viktorjev spodmol also does not essentially differ. It is true that in our case the share of remains of the genus *Sus* is slightly higher than elsewhere, but this could also be a result of overestimation because of the way of quantifying the finds. Among the group of 50 excavated remains of wild boar, some 32 percent of all finds were teeth (with red deer only 6.8%). The same applies to phalanges, of which we counted 17 (34 %; Table 16.2). Since we expressed the number of remains of individual taxa with the number of identified specimens (NISP), we did not attempt to assess to how many animals the excavated skeletal elements could belong (*cf.* Grayson 1984). Certainly such a large share of boar teeth among all the excavated finds of this species allows the possibility that these actually belonged to a relatively small number of animals.

16.6 Instead of a Conclusion

We already mentioned that the relatively modest number of available finds from Viktorjev spodmol put in question many of the theses and interpretations presented above. There was the additional difficulty that the material was collected in three successive phases of excavations, using different techniques and methods. The fact that they could not be compared meant that we were prevented from creating a uniform (and thus larger) sam-

Časovna opredelitev najdb iz zgornjih sedmih režnjev Viktorjevega spodmola (faza IzA) je dokaj ohlapna. Pri tem se moramo zavedati, da obstajajo med različnimi časovnimi obdobji prazgodovine bistvene razlike v npr. pomenu živinoreje, njeni razvojni stopnji, (ne)izkoriščanju različnih sekundarnih produktov in ne nazadnje tudi v sami vlogi lova (npr. Bökönyi 1974). Vse to seveda odseva v specifičnosti arheozooloških vzorcev različnih obdobij, ki zato niso povsem primerljivi. Zaradi tega smo v tem prispevku predstavljeno primerjavo naših ugotovitev s tistimi iz več drugih sočasnih najdišč v regiji omejili izključno na časovno zadovoljivo umeščen mezolitski vzorec (faza IzA). S tem pa še zdaleč nismo zaobšli vseh težav. Predvsem moramo omeniti problematiko različnih metod in tehnik izkopavanj ter vzorčenj, ki so bile uporabljene na posameznih najdiščih. Gre namreč za potencialno zelo moteč dejavnik, ki lahko bistveno vpliva na končne sklepe (npr. Payne 1972b). Zaradi navedenega tudi nismo navajali številčnosti ostankov vsake posamezne vrste posebej. Namesto tega smo delež jelena in (divjega) prašiča, ob srni takratnih dveh poglavitnih lovnih živalih, raje primerjali z deležem vsega t. i. majhnega plena skupaj (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* in *Vulpes*).

Izkazalo se je, da večji del najdišč oblikuje enotno skupino (sl. 16.9). Od nje se bistveno ne razlikuje niti mezolitski vzorec iz Viktorjevega spodmola. Res je sicer, da je v našem primeru delež ostankov rodu *Sus* nekoliko višji kot drugje, vendar bi to lahko bila tudi posledica precenjenosti zaradi načina kvantifikacije najdb. Med skupno 50 izkopanimi ostanki divjega prašiča je bilo namreč kar 32 odstotkov vseh najdb zob (pri jelenu le 6,8 %). Podobno velja za prstnice, ki smo jih našteli 17 (34 %; razpredelnica 16.2). Ker smo številčnost ostankov posameznih taksonov izrazili s številom določenih primerkov (NISP), nismo poskusili oceniti, kolikim živalim bi izkopani skeletni elementi lahko pripadali (glej Grayson 1984). Vsekakor pa tako velik delež prašičjih zob med vsemi izkopanimi najdbami omenjene vrste dopušča možnost, da so ti dejansko pripadali razmeroma majhnemu številu živali.

16.6 Namesto sklepa

Omenili smo že, da razmeroma skromno število razpoložljivih najdb iz Viktorjevega spodmola postavlja pod vprašaj mnoge zgoraj predstavljene teze in interpretacije. Dodatno težavo predstavlja dejstvo, da je bil material zbran v treh zaporednih fazah izkopavanj, ki so se razlikovale po uporabljenih tehnikah in metodah. Njihova neprimerljivost je namreč pozneje onemogočala oblikovanje enotnega (in s tem večjega) vzorca. Smo pa po drugi strani prav zaradi takega načina izkopavanj lahko natančno analizirali prednosti in slabosti posamezne uporabljene metod, s tem pa tudi opozorili na ne-

ple. On the other hand, precisely because of such a method of excavation, we could analyse the advantages and weaknesses of individual methods used, so that we could also draw attention to some traps of which we are sometimes too little aware in our circles.

There is no doubt that the simultaneous collection of bones and teeth during the excavation itself is not a suitable method for collecting the remains of small mammals. Very similar applies for the sampling of macrofauna, since only wet sieving of the sediments enables (although does not also guarantee!) the creation of a representative sample. In order to demonstrate this statement, below we will present some comparisons between samples obtained by classical excavations (i.e., Viktor phase) and those obtained by re-examination of sediment already examined during the Viktor phase, but this time previously wet sieved (Viktor and IzA phase).

Perhaps the clearest advantage of sieving is that we obtain a larger number of finds, and thus of course increase the informative value of the sample itself. In addition, it should not be overlooked that wet sieving essentially changes the ratio between the shares of skeletal elements of individual species (Table 16.10; Fig. 16.10). Thus the classical way of collecting the remains from sediments enables obtaining a larger share of long bones of large mammals (e.g., red deer, bison, pig) and lower and upper jaws, while all other skeletal elements were clearly underestimated. Re-examination of excavated sediments by a professionally more proficient examiner contributed to a partial completing of the sample, in the main by the addition of isolated teeth and a small number of phalanges, carpal and tarsal bones, mainly of larger animals. Only with wet sieving and examination of the material under a dissecting microscope was it possible to collect from the sediment the majority of remains of smaller animals (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* and *Vulpes*) and the remaining phalanges, and carpal and tarsal bones. It is therefore clear that without sieving we cannot avoid underestimating the number of smaller skeletal elements in relation to the larger.

Classical excavation and sampling of material without sieving thus normally also leads to an underestimation of the share of bones and teeth of smaller animals in relation to larger ones. The extent of the error depends on which method of quantification of remains we choose; from this point of view, NISP is undoubtedly the least suitable. However, even the use of indices, such as the minimum number of animals (MNI) or the minimum number of animal units (MAU) does not exclude error if the most frequent skeletal element in the sample (on which their calculation is normally based) was not efficiently collected. Irrespective of the method of quantification, we can therefore justifiably expect that by using sampling without wet sieving, we are *a priori* rejecting the possibility of creating a representative samkatere pasti, ki se jih v naših krogih včasih premalo zavedamo.

Nobenega dvoma ni, da sprotno pobiranje kosti in zob med samim izkopavanjem ni primerna metoda za zbiranje ostankov malih sesalcev. Zelo podobno velja tudi za vzorčenje makrofavne, saj le spiranje sedimenta skozi sita omogoča (čeprav ne tudi zagotavlja!) oblikovanje reprezentativnega vzorca. Da bi dokazali umestnost navedene trditve bomo v nadaljevanju predstavili nekaj primerjav med vzorcem, pridobljenim s klasičnimi izkopavanji (tj. fazo Viktor), in tistim, ki smo ga dobili s ponovnim pregledovanjem med fazo Viktor enkrat že pregledanega sedimenta, a smo ga tokrat predhodno sprali skozi sita (tj. fazo Viktor in IzA).

Morda je najočitnejša prednost spiranja ta, da tako pridobimo večje število najdb, s tem pa se seveda poveča izpovedna vrednost samega vzorca. Poleg tega ne gre spregledati, da spiranje bistveno spremeni razmerja med deleži skeletnih elementov posameznih vrst (razpredelnica 16.10; sl. 16.10). Tako je klasično pobiranje ostankov iz sedimenta sicer omogočalo pridobitev večjega dela dolgih kosti velikih živali (npr. jelena, goveda, prašiča) ter spodnjih in zgornjih čeljustnic, vse druge kategorije pa so bile očitno podcenjene. Ponovno pregledovanje prekopanega sedimenta s strani strokovno bolj podkovanih pregledovalcev je prispevalo k delni izpopolnitvi vzorca, v glavnem z dodatkom izoliranih zob ter manjšega števila prstnic, karpalnih in tarzalnih kosti predvsem večjih živali. Šele s spiranjem in pregledovanjem materiala pod lupo pa je bilo mogoče iz usedlin pobrati večino ostankov manjših živali (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* in *Vulpes*) ter preostanek prstnic, karpalnih in tarzalnih kosti. Očitno je torej, da se brez spiranja ne moremo izogniti podcenjevanju številčnosti manjših skeletnih elementov na račun večjih.

Klasično izkopavanje in vzorčenje materiala brez spiranja tako navadno privede tudi do podcenjevanja

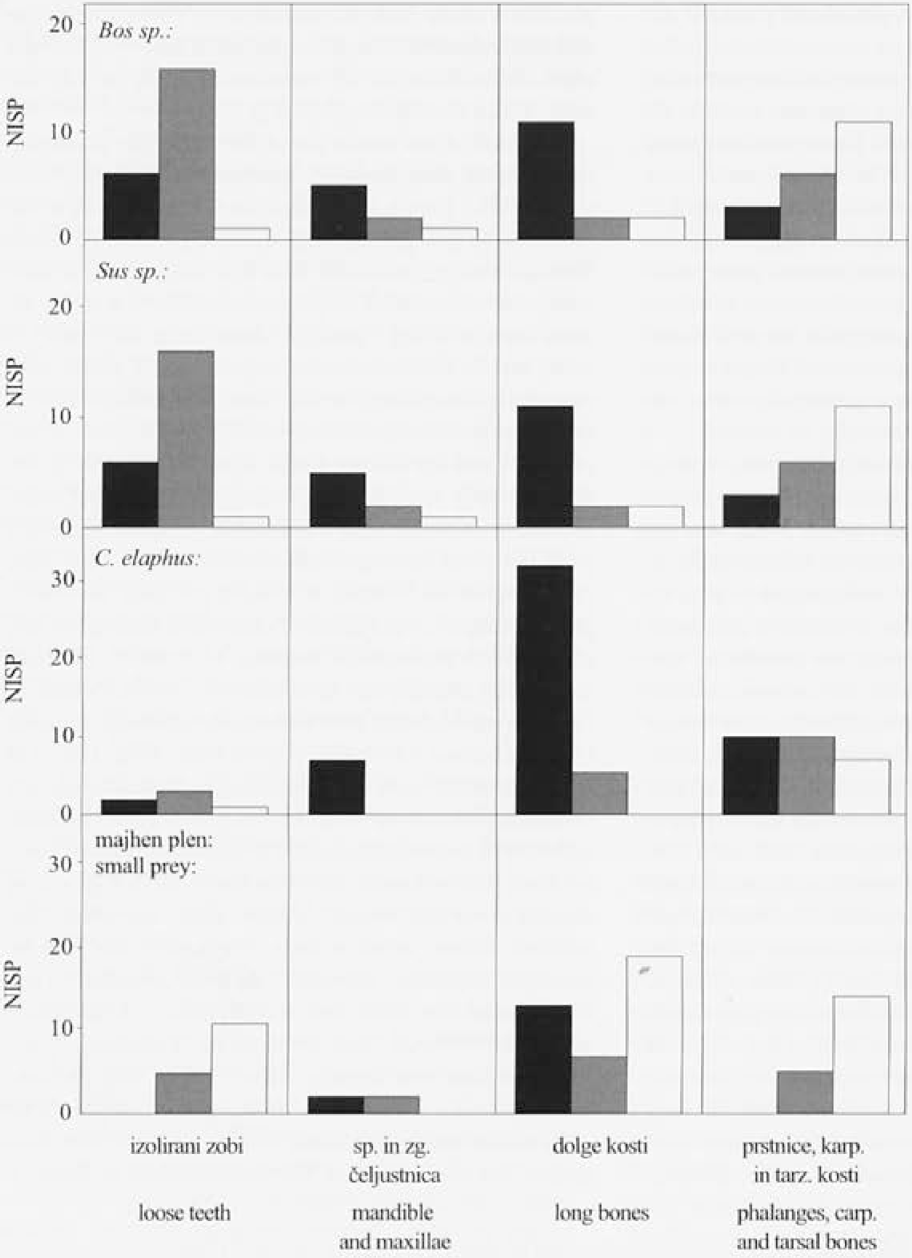
ple. Thus, in the case of remains from Viktor phase, the share of fragments of smaller animals is barely 20%, while after the addition of all remains obtained by wet sieving, it was almost doubled (Fig. 16.11).

Finally, a few words about the technique of excavation by spits with constant, previously specified dimensions of spit. In general, animal remains are grouped on the basis of phases defined with archaeological finds. Such grouping implies the idea that each characteristic change in a sample of bones corresponds to a characteristic change in e.g., pottery, stone tools, etc., that, in other words, within the same archaeological phase, characteristic change e.g., in the form of livestock rearing, the importance of individual secondary products or the roles of hunting, are not likely. It is not difficult to understand why such thinking is dubious. From that point of view it is better that we analyse different materials from the same site (e.g., pottery, chert, bones etc.) independently of each other. Not least, precisely in Viktorjev spodmol such a method of excavation during the IzA phase, with subsequent analysis of remains of small mammals, enabled the identification of the boundary between ecologically two completely different samples (*cf.* Toškan and Kryštufek, this volume) (Fig. 16.12). It is interesting to note that the aforementioned boundary does not correspond with the "archaeological" boundary between the Mesolithic and Prehistoric spits as given by Turk (this volume). It is true that a sufficiently large sample is needed for such a conclusion, but even if the number of finds is not as large as we would like it to be, such an "impartial" approach can draw attention to certain peculiarities which can be additionally analysed subsequently. It would thus certainly be interesting in the future to study the division shown in Fig. 16.6 between the upper and lower parts of the graph, which flows somewhere along spit seven. Insofar as it is not an artefact of the oscillation of the total number of finds, it

Razpredelnica 16.10: Učinkovitost pobiranja živalskih ostankov pri prvem (sonda 1.) in drugem (sonda 2.) pregledovanju nespranega sedimenta iz faze Viktor ter pri tretjem pregledovanju istega vzorca po predhodnem spiranju (S.). Za obrazložitev glej besedilo.

Table 16.10: Effectiveness of collecting animal remains during the first (test trench 1) and second (test trench 2) examination of non-sieved sediments from Viktor phase and with a third examination of the same sample after prior wet sieving (S.). See text for explanation.

Material Material	***Bos* sp.**			***Sus* sp.**			***Ovis / Capra***			***Cervus***			**Majhen plen Small prey**		
	Sonda Trench		**S.**	**Sonda Trench**		**S.**	**Sonda Trench**		**S.**	**Sonda Trench**		**S.**	**Sonda Trench**		**S.**
	1.	**2.**		**1.**	**2.**		**1.**	**2.**		**1.**	**2.**		**1.**	**2.**	
Izolirani zobje Isolated teeth	1	1	--	6	16	1	--	6	2	2	3	1	--	5	11
Sp. in zg. čeljustnica Maxilla & mandibula	1	--	--	5	2	1	--	--	--	7	--	--	2	2	--
Dolge kosti, metapodiji Long bones, metapodia	--	--	--	11	2	2	4	--	--	32	5	--	13	7	19
Prstnice, karp., tarz. kosti Phalan., carp., tars. bones	4	5	--	3	6	11	1	1	--	10	10	7	--	5	14



Sl. 16.10: Učinkovitost pobiranja živalskih ostankov pri prvem (črni stolpiči) in drugem (sivi stolpiči) pregledovanju nespranega sedimenta iz faze Viktor ter pri tretjem pregledovanju istega vzorca po predhodnem spiranju (prazni stolpiči). Za obrazlo-žitev glej besedilo.
Fig. 16.10: Effectiveness of collecting animal remains with the first (black column) and second (grey column) examination of not-sieved sediments from Viktor phase and with the third examination of the same sample after previous wet sieving (empty column). See text for explanation.

deleža kosti in zob manjših živali na račun večjih. Obseg napake je sicer odvisen od tega, kateri način kvantifikacije ostankov izberemo; v tem pogledu je brez dvoma najmanj primeren NISP. Vendar pa tudi uporaba indeksov, kot sta najmanjše število osebkov (MNI) ali pa najmanjše število živalskih enot (MAU), ne izključuje napak, če najpogostejši skeletni element v vzorcu (na katerem navadno temelji njihov izračun) ni bil učinkovito pobran. Ne glede na način kvantifikacije lahko torej upravičeno pričakujemo, da se bomo z vzorčenjem brez spiranja *a priori* odrekli možnosti oblikovanja reprezentativnega vzorca. Tako je bilo tudi v primeru ostankov iz faze Viktor, kjer je bil delež fragmentov manjših živali komaj 20-odstoten, po dodatku vseh ostankov, ki smo jih pridobili s spiranjem, pa se je skoraj podvojil (sl. 16.11).

Ob koncu še nekaj besed o tehniki izkopavanja po

could be perhaps interpreted as a boundary between the Mesolithic and the Prehistoric sample. It is interesting to note that its position in such a case would correspond with the above mentioned boundary between the two samples of small mammals.

Acknowledgement:

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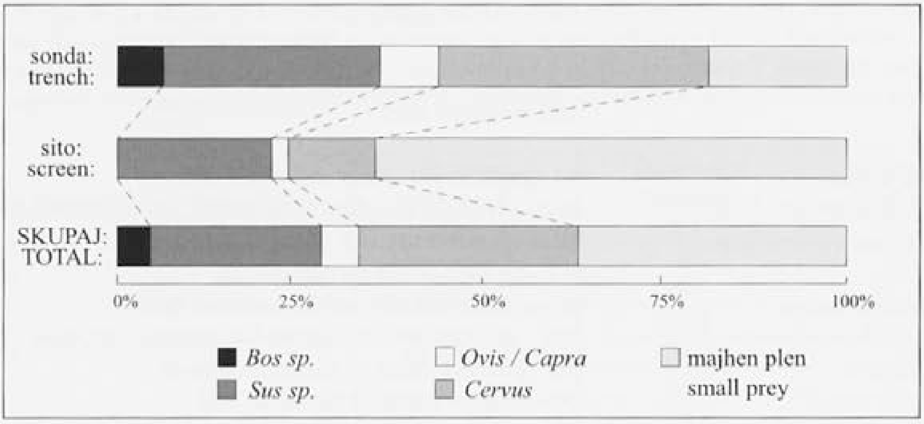
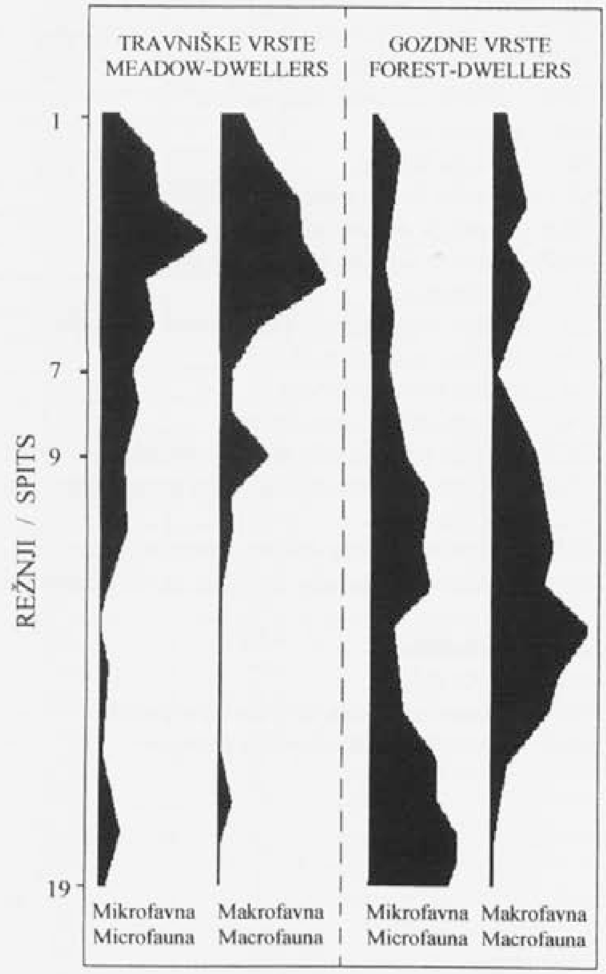


Sl. 16.11: Delež (% NISP) ostankov nekaterih v Viktorjevem spodmolu zastopanih taksonov, pobranih pri klasičnem pregledovanju materiala (sonda) in pri ponovnem pregledovanju istega materiala po spiranju (sito).
Fig. 16.11: Share (% NISP) of remains of some taxa represented in Viktorjev spodmol, with classical examination of material (trench) and with re-examination of the same material after wet sieving (screen).

izkopih s konstantnimi, vnaprej definiranimi dimenzijami režnjev. V splošnem se živalski ostanki grupirajo na osnovi faz, opredeljenih z arheološkimi najdbami. Takšno grupiranje implicira razmišljanje, da se vsaka značilna sprememba v vzorcu kosti časovno ujema z značilno spremembo npr. v keramiki, kamnitem orodju ipd., da torej znotraj iste arheološke faze značilne spremembe npr. v obliki živinoreje, pomenu posameznih sekundarnih produktov ali pa vlogi lova niso verjetne. Povsem razumljivo je, da je takšno razmišljanje sporno. S tega vidika je bolje, da različne materiale iz istega najdišča (npr. keramiko, kremen, kosti ipd.) analiziramo neodvisno drug od drugega. Ne nazadnje je v Viktorjevem spodmolu prav takšen način izkopavanj med fazo IzA pri poznejši analizi ostankov malih sesalcev omogočil identifikacijo meje med dvema ekološko povsem različnima vzorcema (glej Toškan in Kryštufek, ta zbornik) (sl. 16.12). Zanimivo pri tem je, da se ta ne ujema z "arheološko" mejo med mezolitskimi in prazgodovinskimi režnji, kot jo podaja Turk (ta zbornik). Res je sicer, da je za podobne sklepe nujno potreben dovolj obsežen vzorec. A tudi če število najdb ni tako veliko, kot bi si želeli, lahko z "neodvisnim" pristopom opazimo posebnosti, ki jih je mogoče dodatno analizirati v nadaljevanju. Tako bi bilo v bodoče vsekakor zanimivo dodatno proučiti na sliki 16.6 nakazano ločnico med zgornjim in spodnjim delom grafa, ki poteka nekje vzdolž režnja sedem. Koliko ne gre za artefakt nihanja skupnega števila najdb, bi jo bilo morda mogoče interpretirati tudi kot mejo med mezolitskim in prazgodovinskim vzorcem. Zanimivo pri tem je, da bi se njena lega v tem primeru popolnoma ujemala z zgoraj omenjeno mejo med obema vzorcema malih sesalcev.



Sl. 16.12: Vertikalna porazdelitev ostankov na travniške in gozdne habitate vezanih vrst seslacev v Viktorjevem spodmolu, faza IzA.
Fig. 16.12: Vertical distribution of remains of meadow- and forest-dwelling mammal species in Viktorjev spodmol, phase IzA.

Zahvala:

Zahvaljujeva se Ivanu Turku, ki nama je omogočil študij subfosilnega materiala, nama ves čas pomagal s spodbudnimi pogovori in kritično komentiral tudi prvo verzijo besedila. Za omogočen dostop do primerjalne osteološke zbirke Katedre za paleontologijo v okviru Naravoslovno tehniške fakultete gre najina zahvala prof. dr. Vidi Pohar.

16.7 Dodatek

Uporabljene okrajšave:

Bd - največja širina distalnega konca
BFcd - največja širina *facies articularis caudalis*
BFcr - največja širina *facies articularis cranialis*
BG - širina *cavitas glenoidalis*
Bp - največja širina proksimalnega konca
BPC - največja širina *processus coronoideus*-a
DC - največja globina *caput femuris*
Dd - največja globina distalnega konca
DD - najmanjša globina diafize
Dl - največja globina lateralne polovice
DLS - največja diagonalna dolžina temeljne plošče
Dm - največja globina medialne polovice
DPA - globina *processus anconaeus*-a
GB - največja širina
GL - največja dolžina
GLl - največja dolžina lateralne polovice
GLm - največja dolžina medialne polovice
GLP - največja dolžina *processus articularis*
H - višina (height)
LA - dolžina *acetabulum*-a z vključenim robom
Lad - dolžina *arcus dorsalis*
Ld - dolžina hrbtne površine
LG - dolžina *cavitas glenoidalis*-a
M21 - dolžina zobnega niza zgornjih meljakov pri jelenu
M22 - dolžina zobnega niza zgornjih predmeljakov pri jelenu
M23 - največja notranja dolžina orbite pri jelenu
M9 - dolžina zobnega niza spodnjih predmeljakov pri jelenu
m3L - dolžina m3
m3B - širina m3
MBS - širina osrednjega dela temeljne plošče
SLC - najmanjša dolžina *collum scapulae*

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16.7 Supplement

Abbreviations used:

Bd -greatest breadth of the distal end
BFcd -greatest breadth of the caudal articular surface
BFcr -greatest breadth of the cranial articular surface
BG -breadth of the glenoid cavity
Bp -greatest breadth of the proximal end
BPC -greatest breadth across the coronoid process
DC -greatest depth of the *caput femuris*
Dd -greatest depth of the distal end
DD -smallest depth of the diaphysis
Dl -greatest depth of the lateral half
DLS -greatest diagonal length of the sole
Dm -greatest depth of the medial half
DPA -depth across the *processus anconaeus*
GB -greatest breadth
GL -greatest length
GLl -greatest length of the lateral half
GLm -greatest length of the medial half
GLP -greatest length of the glenoid process
H -height
LA -length of the *acetabulum* including the lip
Lad -ength of the dorsal arch
Ld -length of the dorsal surface
LG -length of the glenoid cavity
M21 -length of the upper molar row; *Cervus*
M22 -length of the upper premolar row; *Cervus*
M23 -greatest inner length of the orbit; *Cervus*
M9 - length of the lower premolar row; *Cervus*
m3L -length of m3
m3B -breadth of m3
MBS -middle breath of the sole
SLC -smallest length of the neck of the scapula

Priloga 16.7.1: Dimenzije izmerjenih ostankov jelena (*Cervus elaphus*). Podani so mediana (Me), variacijska širina (min- max.) ter število meritev (n). Dimenzije in so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.1: Dimensions of measured remains of red deer (*Cervus elaphus*). Given are median (Me), range (min-max.) and number of measurements (n). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Mediana (n) Median (n)	min–max
Viktor	plast s keramiko layer with sherds	humerus	BT	56 (1)	--
		metacarpus	Bd	42 (1)	--
		phalanx I	Bd	20,5 (1)	--
	plast brez keramike layer without sherds	os maxillare	M21	122,5 (1)	--
			M22	76 (1)	--
			M23	50 (1)	--
		mandibula	M9	48 (1)	--
			m3L	31,25 (2)	31–31,5
			m3B	14 (2)	14–14
		scapula	LG	42 (1)	--
			GLP	58 (1)	--
		humerus	BT	52 (1)	--
		metatarsus	Bp	37 (1)	--
		os centrotarsale	GB	47 (1)	--
		phalanx I	Bp	21,5 (2)	21–22
			Bd	21 (3)	20,5–21,5
		phalanx III	Ld	50,25 (2)	50–50,5
			DLS	52,5 (2)	52–53
			MBS	16,25 (2)	16–16,5
	premešano disturbed	phalanx I	Bp	23 (1)	--
			Bd	23 (1)	--
		ossa coxae	LA	61 (1)	--
		astragalus	GLl	53,5 (3)	53,5–54,5
			GLm	50 (3)	49,5–50
			Dl	29 (3)	28–29,5
			Dm	30 (3)	29–31
			Bd	33,5 (3)	33–33,5
		calcaneus	GL	119,5 (1)	--
			GB	39,5 (1)	--
		os centrotarsale	GB	46 (1)	--
IzA	režnji 1–7 spits 1–7	phalanx I	Bd	21,5 (1)	--
		os centrotarsale	GB	42,5 (1)	--
	režnji 10–17 spits 10–17	scapula	LG	39,5 (1)	--
			BG	40,5 (1)	--
			SLC	39 (1)	--
		ulna	BPC	29 (1)	--
			DPA	47 (1)	--
		radius	Bp	57 (1)	--
		metacarpus	Bd	47,5 (1)	--
		phalanx I	Bp	19,5 (2)	19–20
			GL	54 (1)	--
		phalanx II	Bp	21 (2)	20–22
			Bd	19 (3)	17–20
			GL	41 (1)	--
		calcaneus	GB	37 (1)	--
		os centrotarsale	GB	42,5 (1)	--

Priloga 16.7.2: Dimenzije izmerjenih ostankov srne (*Capreolus capreolus*). Dimenzije in so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.2: Dimensions of measured remains of roe deer (*Capreolus capreolus*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Vrednost Measure
Viktor	plast s keramiko layer with sherds	atlas	BFcr	32
			BFcd	34
			H	29
			LAd	22,5
	Premešano / disturbed	phalanx I	Bp	11
IzA	režnji 10–19 spits 10–19	phalanx I	Bd	9
		phalanx III	Ld	13,5
			DLS	15,5
			MBS	6

Priloga 16.7.3: Dimenzije izmerjenih ostankov psa (*Canis familiaris*). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.3: Dimensions of measured remains of dog (*Canis familiaris*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Vrednost Measure
IzA	režnji 1–7 spits 1–7	phalanx II	Bp	8
			Bd	7,5
			GL	15
	režnji 10–19 spits 10–19	phalanx I	Bp	12

Priloga 16.7.4: Dimenzije izmerjenih ostankov domačega goveda (*Bos taurus*). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.4: Dimensions of measured remains of domestic cattle (*Bos taurus*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Vrednost Measure
Viktor	plast s keramiko layer with sherds	mandibula	M9	56,5
		phalanx I	Bd	32,5
		phalanx II	Bp	30
			Bd	25,5
			GL	44

Priloga 16.7.5: Dimenzije izmerjenih ostankov tura (*Bos* cf. *primigenius*). Podani so mediana (Me), variacijska širina (min-max.) ter število meritev (n). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.5: Dimensions of measured remains of aurochs (*Bos* cf. *primigenius*). Given are median (Me), range (min-max.) and number of measurements (n). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Mediana (n) Median (n)	min - max
Viktor	plast brez keramike layer without sherds	phalanx I	Bp	40 (2)	40–40
		phalanx III	MBS	34 (1)	--

Priloga 16.7.6: Dimenzije izmerjenih ostankov divje mačke (*Felis silvestris*). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.6: Dimensions of measured remains of wild cat (*Felis silvestris*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Vrednost Measure
Viktor	plast s keramiko layer with sherds	femur	Bp	17
			DC	7
	plast brez keramike layer without sherds	humerus	Bd	24
			BT	17,5
IzA	režnji 1–7 / spits 1–7	astragalus	GL	14

Priloga 16.7.7: Dimenzije izmerjenih ostankov poljskega zajca (*Lepus europaeus*). Podani so mediana (Me), variacijska širina (min- max.) ter število meritev (n). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.7: Dimensions of measured remains of hare (*Lepus europaeus*). Given are median (Me), range (min-max.) and number of measurements (n). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Vzorec	Element Element	Dimenzija Dimension	Mediana (n) Median (n)	min–max
Viktor	plast s keramiko / layer with sherds	humerus	Bd	12 (1)	--
	Premešano / disturbed	calcaneus	GB	11 (1)	--
IzA	režnji 1–7 spits 1–7	mandibula	višina za m2 height behind m2	18 (1)	--
		radius	Bp	9,75 (2)	9,5–10
		phalanx I	Bp	6 (2)	6–6
			Bd	4 (2)	4–4
		phalanx II	Bp	5 (5)	4–5,5
			Bd	3 (5)	3–4
		tibia	Bd	16,5 (1)	--
			Dd	10 (1)	--
		astragalus	GL	16 (3)	15–16
	režnji 10–19 / spits 10–19	femur	DC	9	--

Priloga 16.7.8: Dimenzije izmerjenih ostankov kune (*Martes* sp.). Podani so mediana (Me), variacijska širina (min- max.) ter število meritev (n). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.8: Dimensions of measured remains of marten (*Martes* sp.). Given are median (Me), range (min-max.) and number of measurements (n). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Mediana (n) Median (n)	min–max
Viktor	premešano disturbed	radius	Bp	7 (1)	--
IzA	režnji 1–7 spits 1–7	humerus	BT	11,25 (2)	10,5–12
	režnji 10–19 spits 10–19	calcaneus	GL	20 (1)	--
			GB	11 (1)	--

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Priloga 16.7.9: Dimenzije izmerjenih ostankov drobnice (*Ovis* s. *Capra*). Zvezdica (*) označuje ostanke ovce (*Ovis aries*). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.9: Dimensions of measured remains of ovicaprines (*Ovis* s. *Capra*). An asterisk (*) marks the remains of sheep (*Ovis aries*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza **Phase**	**Vzorec** **Sample**	**Element** **Element**	**Dimenzija** **Dimension**	**Vrednost** **Value**
Viktor	plast s keramiko layer with sherds	os centrotarsale	GB	25
		tibia	Bd	22
			Dd	19,5
Viktor IzA	sito (10 mm) / sieve (10 mm9	m3	m3L	20,5
IzA	režnji 1–7 spits 1–7	radius	Bp	25
		phalanx I	Bp	11
			Bd	10,5
			GL	33
			SD	9
			DD	8
		femur *	Bp	40
			DC	18

Priloga 16.7.10: Dimenzije izmerjenih ostankov rjavega medveda (*Ursus arctos*). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.10: Dimensions of measured remains of brown bear (*Ursus arctos*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza **Phase**	**Vzorec** **Sample**	**Element** **Element**	**Dimenzija** **Dimension**	**Vrednost** **Measure**
Viktor	plast brez keramike / layer without sherds	humerus	BT	60
IzA	režnji 10–19 / spits 10–19	metacarpus II	Bp	15
			Bd	19,5
			GL	76
			SD	12
			DD	9,5

Priloga 16.7.11: Dimenzije izmerjenih ostankov prašiča (*Sus* sp.). Podani so mediana (Me), variacijska širina (min- max.) ter število meritev (n). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.11: Dimensions of measured remains of domestic pig / wild boar (*Sus* sp.). Given are median (Me), range (min-max.) and number of measurements (n). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Mediana (n) Median (n)	min–max
Viktor	plast s keramiko layer with sherds	metacarpus V	GL	74 (1)	--
		phalanx I	Bp	15,5 (1)	--
			Bd	11 (1)	--
			GL	31,5 (1)	--
			SD	10 (1)	--
			DD	11 (1)	--
	plast brez keramike layer without sherds	radius	Bp	31,5 (1)	--
		metacarpus III	Bp	20 (1)	--
		metacarpus IV	Bp	20 (1)	--
		astragalus	GLl	53 (1)	--
			GLm	47 (1)	--
			Dl	28,5 (1)	--
			Dm	30,5 (1)	--
			Bd	30 (1)	--
	premešano / disturbed	radius	Bp	34 (1)	--
IzA	režnji 1–7 spits 1–7	phalanx I	Bp	19,5 (1)	--
			Bd	19 (1)	--
			GL	30 (1)	--
		phalanx III	MBS	17 (1)	--
	režnji 10–17 spits 10–17	metatarsus IV	Bp	20,5 (2)	18,5–23,5
		phalanx II	Bp	18,75 (2)	18–19,5
			Bd	14,5 (3)	13,5–14,5
			GL	28,25 (2)	27–29,5
		phalanx III	MBS	13,5 (2)	12–15
			Ld	34 (1)	--
			DLS	33 (1)	--

Priloga 16.7.12: Dimenzije izmerjenih ostankov lisice (*Vulpes vulpes*). Dimenzije so povzete po Von den Drieschevi (1976). Vse meritve so v mm.
Table 16.7.12: Dimensions of measured remains of fox (*Vulpes vulpes*). Dimensions are according to Von den Driesch (1976). All measurements are in mm.

Faza Phase	Vzorec Sample	Element Element	Dimenzija Dimension	Vrednost Measure
Viktor	plast s keramiko layer with sherds	m1	m1L	15
			m1B	6
Viktor IzA	sito (10 mm) sieve (10 mm)	ulna	BPC	10
		calcaneus	GL	31
			GB	11
		astragalus	GL	18
IzA	režnji 1–7 spits 1–7	femur	Bp	16
			Bd	21,5
			DC	12
			GL	128
	režnji 10–19 spits 10–19	phalanx II	Bp	6
			Bd	5
			GL	11