Human Use of the Northern Urals Caves from the Late Pleistocene to Modern Times: an archaeozoological perspective

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Abstract

The purpose of this paper is to define the human element in cave taphonomy based on a study of the fauna! remains from cave deposits in the northern Urals and the historical role of caves in human life. Only those animal species likely to have been hunted for food by humans and animal predators are discussed. The paper deals with published information and original data on fossil faunas from five caves on the eastern slope and five caves on the western slope of the northern Urals.

During the Pleistocene humans were the ecological analogue of large animal predators and used the caves as temporary, possibly seasonal, hunting sites. The changes in prey species composition at the Pleistocene/Holocene boundary were initiated primarily by global biotic changes. During the early Holocene the northern Urals caves were used as sanctuaries and temporary hunting sites. During the Palaeolithic the main prey was reindeer, whereas in the Holocene it was elk. With the Iron Age caves began to be used as sanctuaries where bear, reindeer, horse beaver or some other species, depending on beliefs, location of human settlements, and cultural and economic level, became the cult objects. Remains of domestic animals found in sacrificial places reflect the intrusion of economically productive species into the taiga zone. The aborigines of the northern Urals (Khants and Mansis) continued to use caves for sacrificial rites until the middle of the 19th century.

It is concluded that humans have always used mainly those parts of the northern Urals caves where daylight could reach. Differences in the human use of the caves on the eastern and western slopes of the Urals were caused by local biotic differences, by cultural differences among the ancient populations, and by differing levels of research activity.

The northern Urals are a region of well-developed karst, especially on the western slope. To date, around 150 caves and rockshelters have been discovered on the western slope; of these 90% are of horizontal type, while 10% are vertical shafts. On the eastern slope 20 caves and rockshelters are known, all but one of horizontal type. In all the caves animal bones are abundant on the cave floor and in the cave deposits. Bone accumulation and distribution in cave deposits depends on several factors - cave morphology, climatic conditions, as well as the activities of humans and animals. Most of the bones found in cave deposits are those of small mammals, especially rodents. These are mainly remains of the prey of bird and mammalian predators that used the caves as temporary or permanent shelters. Small mammal fossils are now widely used for palaeo-environmental reconstruction. These are not discussed in the present paper, which focuses on the remains of mammalian species which had food value for humans. The purpose of this paper is to define the human element in cave taphonomy based on analysis of faunal remains from the northern Urals caves, as well as the historical role of caves in the human settlement of the region.

Taphonomic processes

All the caves discussed are 'horizontal' caves and are similar in respect of their accessibility for man and various animal species. They are close to one another and global climatic changes affecting sedimentation rates were synchronous for them. Hence, the caves discussed can be considered homogeneous as regards the taphonomic processes that led to the formation of their bone assemblages. Thus, variations in species composition and skeletal element proportions among the animal bone assemblages will have been caused by two sets of processes - natural and anthropogenic. In the first case bones have accumulated through the activities of animal predators (prey remains) and natural animal deaths (due to age or illness, during winter hibernation, or in cave-traps). In the second case bone accumulation was the result of human activity (hunting, sacrificial rites). Furthermore, species composi¬tion was undoubtedly affected by local topographic and climatic factors, and also depended on changes in species areas.

Bone assemblages from artifact-bearing layers normally have resulted from both natural and anthropogenic processes. This presents difficulties for interpreting fossil data. The bones that got into a cave as a result of various processes can be classified on the basis of degree of completeness/breakage patterns and relative proportions of skeletal elements for the various species represented. Bones that entered the cave through natural processes are characterized by traces of gnawing and 'proportional' representation of different skeletal elements. Bones deposited as a result of human activity can be identified by specific breakage patterns, 'non-proportional' representa¬tion of skeletal elements - primarily over-representation of cranial *vs* postcranial elements - as well as by the pattern of

Table 1 Caves of the western slope of the northern Urals.

Site	*Location*	*Excavated area*	*Number of Layers*	*Reference*
Medvezhya	Upper Pechora river	142m^2	6	Guslitser & Kanivets 1965
Kaninskaya	Upper Pechora river	82m^2	6	Kanivets 1964; Guslitser & Kanivets 1965
Unjinskaya	Upper Pechora river	44m^2	8	Guslitser & Kanivets 1965
Pervokamennaya	Upper Pechora river	8m^2	5	Guslitser & Kanivets 1965
Eshmesskaya	Izhma river	19m^2	5	Murygin 1987

Table 2 Caves of the eastern slope of the northern Urals (* - indicates that all layers contained bones).

Site	*Location*	*Excavated area*	*Number of Layers*	*Reference*
Shaitanskaya	Ivdel river	27m^2	4*	Kosintsev & Borodin 1990
Lakseiskaya	Ivdel river	30m^2	4	Kosintsev & Borodin 1990
Zhilische Sokola	Kakva river	20m^2	3*	
Ushminskaya	Lozva river	10m^2	2	
Lobvinskaya	Lobva river	20m^2	5	Chairkin 1989

species occurrence. However, it is impossible to make a complete classification of bones brought into caves by humans and animal predators. It is only in bone-bearing layers which do not contain artifacts that 'pure' fossil assemblages can be distinguished and used as a 'yardstick' to define the relative roles played by human and non-human factors in cave taphonomy.

The northern Urals caves

The northern Urals are now part of the taiga zone. In spite of their relatively low relief, the ecosystems of the western and eastern slopes are markedly different. This was brought about by differing sedimentation rates and the slightly different histories of the European and Asiatic ecosystems, that are the natural preconditions of cultural and economic differentiation of the ancient inhabitants of the northern Urals, whose ethnic origin is obscure. The modern aborigines are Finno-Ugric, but since the 17th century the northern Urals have been actively developed by Russians.

The first descriptions of the caves and bone assemblages found in this region date from the end of the 18th century, although systematic archaeological and palaeontological investigations only began in the late 1950s. These investigations have made it possible to reconstruct the principal aspects of human exploitation of caves in the region. The present paper is based on a combination of published data on fossil faunas from the northern Urals caves and data obtained by the authors in the field. We consider the results of excavations in five caves on the western slope and five on the eastern slope *{Tables 1 & 2).*

In large caves (Medvezhya, Kaninskaya, Unjinskaya, Lakseiskaya, Zhilische Sokola), in order to determine which part of the cave and at what time-period it was used by humans, small excavations were made in the entrance zone and in the front part of the cave, as well as in the inner passages. In the inner passages beyond the reach of natural light no traces of human activity were found in the cave deposits, although traces of recent activity were found on the floor. This suggests that prehistoric people visited only the front parts of the northern Urals caves, while the more remote parts of the caves were seldom, if ever, visited. People from modern villages near to the caves normally do not venture further than the front part of the cave and have no idea how deep the cave is. The bigger caves as a rale are associated with local legends.

Remote parts of the caves are now visited by tourists and speleologists. Thus, at all historical periods local people

Table 3 Species composition of mammalian bone assemblages from archaeological excavations in caves on the western slope of the Nothern Urals (after I. Kuzmina). N – number of bones; MNI – minimum number of individuals.

Species	LATE PLEISTOCENE				HOLOCENE								
	Medvezhya				Kaninskaya				Unjinskaya		Pervokamennaya		Eshmesskaya
	site		lair		Bronze Age		Iron Age						
	N	*MNI*	*N*	*MNI*	*N*	*MNI*	*N*	*MNI*	*N*	*MNI*	*N*	*MNI*	*N*
Lepus tanaiticus	4343	293	411	31	–	–	–	–	–	–	–	–	–
Lepus timidus	–	–	–	–	121	8	229	7	53	3	105	6	+
Sciurus vulgaris	15	2	67	9	95	12	235	14	72	9	14	4	–
Castor fiber	2	1	1	1	173	10	332	12	214	12	–	–	70
Canis lupus	208	7	103	5	14	1	13	1	16	1	–	–	?
Alopex lagopus	1003	96	103	17	20	3	12	2	3	1	24	2	–
Vulpes vulpes	10	4	1	1	5	1	6	1	–	–	27	2	–
Ursus arctos	–	–	3	1	1210	25	1128	57	181	9	95	5	–
Ursus spelæus	674	21	320	7	–	–	–	–	–	–	–	–	–
Martes sp.	9	3	6	2	61	7	77	7	254	16	6	3	–
Gulo gulo	11	2	–	–	33	5	76	10	26	2	–	–	–
Mustela erminea	32	7	–	–	–	–	–	–	–	–	–	–	–
Mustela eversmanni	21	2	2	1	–	–	–	–	–	–	–	–	–
Meles meles	–	–	–	–	6	1	2	1	–	–	11	3	–
Lutra lutra	–	–	–	–	16	4	43	6	39	5	1	1	–
Panthera spelaea	6	1	7	1	–	–	–	–	–	–	–	–	–
Felis lynx	–	–	–	–	2	1	3	1	–	–	–	–	–
Mammuthus primigenius	109	4	42	1	3	–	137	–	–	–	–	–	–
Equus uralensis	337	8	60	3	–	–	–	–	–	–	–	–	–
Coelodonta antiquitatis	77	6	20	2	–	–	–	–	–	–	–	–	–
Capreolus pygargus	23	3	4	1	–	–	3	1	2	1	–	–	–
Alces alces	9	2	8	1	161	4	513	15	73	2	–	–	–
Rangifer tarandus	5698	86	1344	35	129	4	196	6	242	10	–	–	5
Bison priscus	28	2	11	1	–	–	–	–	–	–	–	–	–
Saiga tatarica	40	4	1	1	–	–	–	–	–	–	–	–	–
Ovibos moschatus	181	8	18	2	–	–	–	–	–	–	–	–	–
Equus caballus	–	–	–	–	2	1	11	1	20	3	–	–	–
Sus scrofa f. domestica	–	–	–	–	–	–	1	1	–	–	–	–	–
Bos taurus	–	–	–	–	1	1	3	1	–	–	–	–	–
Ovis aries	–	–	–	–	1	1	14	2	20	2	–	–	–

Table 4 Species composition of mammalian bone assemblages from archaeological excavations in caves on the eastern slope of Nothern Urals. N – number of bones; MNI – minimum number of individuals.

SPECIES	LATE PLEISTOCENE		HOLOCENE													
	Shaitanskaya						Lakseiskaya		Zhilische Sokola				Ushminskaya		Lobvinskaya	
	lair		site		site		sanctuary				site		sanctuary			
	N	MNI	N	MNI	N	MNI	N	MNI	N	MNI	N	MNI	N	MNI	N	MNI	N	MNI
Lepus tanaiticus	43	4	49	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lepus timidus	–	–	–	–	2	1	23	4	27	5	19	4	4	1	6	2	41	8
Sciurus vulgaris	–	–	–	–	8	3	8	4	–	–	–	–	9	2	–	–	21	6
Castor fiber	–	–	–	–	–	–	6	2	15	2	1	1	2	1	9	3	–	–
Canis lupus	14	3	4	1	–	–	1	1	18	2	–	–	1	1	1	1	1	1
Alopex lagopus	7	3	13	3	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Vulpes vulpes	–	–	3	2	–	–	3	1	6	1	3	2	–	–	–	–	2	1
Ursus arctos	–	–	–	–	1	1	261	15	52	5	–	–	56	7	110	16	390	30
Ursus spelaeus	8	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Martes sp.	–	–	1	1	–	–	1	1	7	2	2	1	1	1	–	–	4	2
Gulo gulo	2	1	–	–	–	–	–	–	2	1	–	–	–	–	–	–	–	–
Mustella erminea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	2
Panthera spelaea	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Mammuthus primigenius	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Equus aff latipes	143	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Equus uralensis	–	–	12	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Coelodonta antiquitatis	66	3	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cervus elaphus	4	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Capreolus pygargus	–	–	–	–	–	–	–	–	–	–	1	1	–	–	1	1	–	–
Alces alces	–	–	–	–	39	4	16	4	72	5	24	4	65	5	41	4	93	10
Rangifer tarandus	220	10	30	3	2	1	17	5	30	3	5	2	4	1	–	–	21	4
Bison priscus	62	4	3	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Saiga tatarica	3	2	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ovibos moschatus	12	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Equus caballus	–	–	–	–	–	–	52	5	8	2	–	–	6	3	–	–	77	8
Canis familiaris	–	–	–	–	–	–	–	–	8	2	–	–	–	–	–	–	–	–
Bos taurus	–	–	–	–	–	–	–	–	3	2	–	–	–	–	–	–	–	–

only visited the entrance zones and front parts of the northern Urals caves. While using the caves people left there not only various artifacts, but animal bones too. These bones got into the deposits as a result of human hunting or cult activities. Below we consider the characteristics of bone assemblages relating to various human activities.

Cave use in the Late Pleistocene

The earliest traces of human activity in the Urals, belonging to the Mousterian stage, have been found in Studyonaya Cave on the western slope, and are dated by palaeontological methods to the early Würm (Guslitser *et al.* 1989).

The most numerous Palaeolithic remains occur in Medvezhya Cave, also on the western slope (Guslitser & Kanivets 1964), and are dated to the Early Upper Palaeolithic *ca* 24,000-40,000 BP (Rogachov & Anicovich 1984). During excavations of the entrance zone and front part of Medvezhya Cave, the artifacts were found with Late Pleistocene animal remains *(Mammuthus primigenius* Blum., *Coelodonta antiquitatus* Blum., *Bison priscus* Boj., *Ursus spelaeus* Ros. et Hein.) in the lower brown loam layer. In the 142m^2 excavated 738 artifacts associated with hunting were found - an average density of *ca* 5 artifacts per square metre. No traces of fires were noted other than small charcoal pieces.

About 2000 shed reindeer antlers got into Medvezhya Cave. In this quantity they could only have been brought there by humans. They were probably used for fixing animal skins on the roofs of light shelters.

This evidence indicates that Upper Palaeolithic hunters used the caves as temporary, possibly seasonal, camp sites. Many of the northern Urals caves on both the eastern and western slopes contain traces of brief visits throughout the Upper Palaeolithic. This is confirmed by the occurrence of several artifacts in the upper light-grey layer in Shaitanski Rockshelter. This layer has a radiocarbon date of 14,500±500 BP (Petrin 1987).

As mentioned above, layers containing traces of Upper Palaeolithic hunting camps have bones resulting from the activities of both humans and animal predators. In order to determine the specific character of the bone assemblages associated with human activity, the composition of the assemblages from the artifact-bearing layers was compared with layers containing bone accumulations of non-human origin (i.e. those formed in predators' lairs). The data compared were taken from Medvezhya and Shaitanskaya caves. These two excavations *(Tables 3 &4)* differ in species composition owing to their differing geographical locations and sample sizes (Kosintsev & Borodin 1990). Comparison of the remains of the main prey species from archaeological layers and animal lairs reveals close similarities - especially in Medvezhya Cave. The main prey of both humans and animal predators was reindeer. The principal difference between the prey assemblages from the archaeological layers and animal lairs in Medvezhya Cave and Shaitanski Rockshelter is the large percentage of bones of hares in the archaeological layers *(Table 5).* These data indicate that the composition of prey accumulations of large animal predators and Upper Palaeolithic hunters is similar, except that humans took more hares. This information may help to clarify the place of humans in the Late Pleistocene biota and their role in Pleistocene megafaunal extinctions. Being the ecological analogue of large animal predators humans are unlikely to have been the decisive factor in the extinction of the mammoth, woolly rhinoceros and other species.

Cave use in the Holocene

During the Holocene considerable changes in species composition of bone assemblages occurred *(Tables 3 & 4),* brought about by changes of the whole biota at the Pleistocene/Holocene boundary (Kuzmina 1971). Large ungulates (elk) became predominant among the main food species, while in the Palaeolithic small ungulates (reindeer) were the most numerous. Squirrel became an important hunting species *(Table 5).* The quantity of brown bear bones is considerably higher in Holocene layers. Bones of domesticated animals also appear. But in artifact-bearing layers, interpreted as hunters' camps, there are very few bear remains and no bones of domesticated animals *(Table* 5).

The Early Holocene data are comparatively poor. In Pervokamennaya Cave (western slope) at the contact between the Holocene and Pleistocene deposits, a harpoon fragment was found which is of similar type to those used by Mesolithic and Neolithic populations in central and western Europe (Guslitser & Kanivets 1965). Mammalian bones from this layer represent the earliest sanctuary assemblage in the northern Urals; they comprise mainly bear remains represented by cranial bones (Guslitser & Kanivets 1965). In Lobvinskaya Cave, also in deposits belonging to the Pleistocene/Holocene transition (dated to 9500±250 BP), fragments of hunting weapons were found. The animal bones from this layer are very few and difficult to interpret.

In the Eneolithic the northern Urals caves were used by humans as short-stay hunters' shelters, at least on the eastern slope. This is confirmed by the data from Zhilische Sokola Cave where a few artifacts and bones broken by man were found.

In Kaninskaya Cave sanctuary dating to the Bronze Age (Kanivets 1964), as well as in the earlier sanctuaries of the region, bear bones predominate but remains of domestic animals are also found *(Table 5).* At that period the eastern slope caves were still used as short-term hunting shelters. This is demonstrated by the data from Shaitanski Rockshelter and Zhilische Sokola Cave where, along with a few artifacts relating to hunting activity during the Bronze Age, bones broken by man were found.

During the Iron Age caves were used by humans only as sanctuaries. A specific set of artifacts (a few ceramic items, numerous bronze decorations, coins, anthropomorphic figures made of wood, metal and bone), the species composition, as well as the pattern of occurrence of skeletal elements, testify to this (Kanivets 1964; Guslitser & Kanivets 1965; Murygin 1987).

In sanctuaries of the Bronze, Iron and Middle Ages, the most numerous animal remains are those of bear, although

Table 5 Frequencies of species from taphonomically different layers of the northern Urals caves (%).

Species	Lair		Pleistocene Sites		Holocene Sites		Western Slope Sanctuaries					Eastern Slope Sanctuaries				
	1	2	1	2	1	2	3	4	5	6	7	8	9	10	11	12
Lepus sp.	19.0	7.5	33.6	45.8	3.7	34.6	5.9	7.9	4.4	37.1	?	3.5	6.1	12.9	6.4	2.7
Sciurus vulgaris	3.1	0.0	0.1	0.0	18.5	0.0	4.7	8.1	5.9	4.9	0.0	0.0	1.1	0.0	3.3	6.0
Castor fiber	0.05	0.0	0.02	0.0	0.0	1.8	8.5	11.5	17.6	0.0	81.8	5.2	1.7	7.1	0.0	1.3
Canidae	9.6	3.6	9.4	18.7	0.0	5.6	1.9	1.1	1.6	18.0	?	0.0	1.1	8.1	0.4	0.7
Ursus arctos	0.1	0.0	0.0	0.0	1.9	0.0	59.4	39.0	14.9	33.6	0.0	65.9	68.3	24.8	60.4	36.9
Mustelidae	0.3	0.4	0.2	0.9	0.0	3.6	5.0	6.9	26.3	6.4	0.0	0.0	0.3	4.3	0.7	0.7
Big ungulates	4.6	47.7	3.5	15.0	72.2	43.6	7.9	17.7	6.0	0.0	0.0	25.4	3.6	21.4	16.6	45.0
Small ungulates	63.3	40.8	45.9	29.0	3.7	10.9	6.3	6.9	20.1	0.0	5.5	0.0	4.4	13.3	1.1	2.7
Domestic animals	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	3.3	0.0	0.0	0.0	13.5	8.1	11.5	4.0

Key: 1 – Medvezhya; 2 – Shaitanskaya; 3 – Kaninskaya, Bronze Age; 4 – Kaninskaya, Iron Age; 5 – Unjinskaya; 6 – Pervokamennaya; 7 – Eshmesskaya; 8 – Unjinskaya; 9 – Shaitanskaya; 10 – Lakseiskaya; 11 – Lobvinskaya; 12 – Zhilische Sokola. Canidae group includes: *Canis lupus*, *Alopex lagopus*, *Vulpes vulpes*. Mustellidae include: *Martes* sp., *Gulo gulo*, *Meles meles*, *Lutra lutra*. Large ungulates include: *Equus* sp., *Coelodonta antiquitatis*, *Bison priscus*, *Alces alces*. Small ungulates include: *Cervus elaphus*, *Capreolus pygargus*, *Rangifer tarandus*. ? – no data.

Table 6 Frequencies of cranial (Cr) and postcranial (Pc) skeletal elements from different excavations (%).

Species	Western slope				Eastern slope					
	Pleistocene		Holocene		Pleistocene		Holocene			
							Site		Sanctuary	
	Cr	Pc	Cr	Pc	Cr	Pc	Cr	Pc	Cr	Pc
Lepus sp.	19	81	14	86	13	87	29	71	11	89
Canidae	59	41	53	47	67	33	–	–	–	–
Ursus arctos L.	–	–	79	21	–	–	–	–	88	12
Equus (E) sp.	26	74	58	42	34	66	–	–	80	20
Rangifer tarandus	19	81	80	20	19	81	–	–	41	59
Alces alces L.	–	–	–	–	–	–	24	76	75	25

the proportion of elk and domesticated animals increases considerably. The bone assemblage from Unjinskaya Cave sanctuary differs markedly from those of other caves; reindeer and Martes spp. predominate, with bear in only third place. Analysis of the bone assemblages from caves on the western slope *(Table 6)* shows that for *Lepus* spp. and Canidae the ratio of cranial:postcranial elements is similar in both Pleistocene and Holocene layers. By contrast, cranial:postcranial proportions for reindeer and horse are different in Holocene and Pleistocene layers - in Holocene deposits cranial bones dominate. Bear remains from Holocene layers show crania:postcranial proportions like those of horse and reindeer. Thus bone accumulation processes for *Lepus* and Canidae were similar in the Pleistocene and Holocene, while they differed in the case of reindeer and horse.

Given that almost all bones of bear, reindeer and horse from Holocene deposits come from sanctuaries, it may be concluded that the skeletal element proportions resulted from human activity and the development of cult rituals (the native peoples picked up fossil bones and brought them to sanctuaries - modern inhabitants of the northern Urals have the same rite). Of all the northern Urals cave sanctuaries, particular attention should be paid to Eshmesskaya Cave. According to archaeological data and radiocarbon dating (Murygin 1987) this sanctuary functioned for a short period of time and seems to have been specialized. The absolute prevalence of beaver remains — comprising 81.8% of the total assemblage — of which 93.3% are cranial bones, confirms this.

Eastern slope cave sanctuaries are known from the Middle Ages onwards and their bone assemblages show certain differences compared to late sanctuaries on the western slope. In general, the sanctuaries of the eastern slope contain more bones of bear, elk and domestic horse, and fewer bones of beaver, Mustelidae and reindeer; the bones of small cattle and pigs are absent *(Tables 3-5).* This is probably connected with differences in the beliefs of the eastern and western slope populations during the Middle Ages. The relative proportions of cranial and postcranial bones of species represented in the eastern and western slope sanctuaries are similar. Reindeer presents certain distinctions but this may be associated with insufficient data *(Table 4).* Elk, which is absent from western slope sanctuaries, is represented mainly by cranial bones, testifying to the use of this species as a sacrificial animal *(Table 6).*

Analysis of the data from all sanctuaries demonstrates their diversity in cult species, and the large quantities of artifacts and bones point to multiple visits to most of the sanctuaries and different ceremonies performed there, probably over hundreds of years. The aborigines of the northern Urals (Khants and Mansis) used caves as sacrificial places until the middle of the 19th century. The archaeological data relating to human exploitation of the caves testify to the originality of this process in the northern Urals. In contrast to the southern Urals, there are no Late Palaeolithic sanctuaries with rock art (Bader 1965; Okladnikov & Petrin 1983). Conversely, only the northern Urals caves contain sanctuaries dating to the Holocene (Kanivets 1964; Guslitser & Kanivets 1965; Murygin 1987). There are no sanctuaries of this period in the southern Urals, and only one is known from the middle Urals (Prokoshev 1935). No fundamental distinctions are revealed in human exploitation of the eastern and western slopes of the Urals; those differences that do exist are related to local biotic differences, cultural differences among the ancient population, and the fact that the eastern and western slopes have been explored to differing extents.

Nowadays the northern Urals caves are tourist attractions, on the one hand, and have the same value for humans as in the Stone Age, on the other - hunters and fishermen use them as temporary shelters, so that a new cultural layer has begun to form there. There are no bone remains associated with visits to the caves by modern humans. When staying in the caves contemporary people eat canned food, and this is reflected in the modern debris found there. Modern hunters and fishermen, as the absence of bones shows, take all their prey to the places where they live - their villages and towns. Consequently, today there is no anthropogenic factor in the formation of bone assemblages in caves. The value of caves for humans has also changed, from being an important element in the economic cycle to a secondary element in the human recreational system.

Conclusion

Archaeological and archaeozoological data prove that the northern Urals caves have been used by humans since the late Middle Palaeolithic. In spite of their long history of exploitation, however, in no period were they used as long-term residences. In ancient times they were places of short, probably seasonal, occupations or ceremonial places for rites and sacrifices. Moreover, most activities were confined to the day-lit foreground of the caves. Thus, the caves were used first as shelters, then as sanctuaries, and now as shelters and tourist attractions.

The changes in species composition and skeletal element proportions evident in the animal bone assemblages provide information on environmental changes as well as on the development of human cultural and economic relations. Bones of domesticated animals found in sacrificial assemblages are evidence of the spread of a food-producing economy into the Taiga zone. At present the caves are repeatedly used as short-term shelters which results in their becoming littered with rubbish and threatens to destroy these unique ethnographic and archaeological monuments. For this reason, it is indispensable to protect them.

References

BADER, O.N. 1965. *Kapova peschera* (Kapova Cave). Nauka, Moscow.

CHAIRKIN, S.E. 1989. Issledovania v Lobvinskoy (Shaitanskoy) zhertvennoy peschere (Investigations in Lobvinskaya sacrificial cave). In *Arkheologicheskie otkrytia Urala i Povolzhia,* edited by E. Savelieva, pp. 168-170. Komi Research Centre, Syktyvkar.

GUSLITSER, B.I. & KANIVETS, V.I. 1965. *Peschery Pechorskogo Urala* (Caves of the Pechora Urals). Nauka, Moscow.

GUSLITSER, B.I., PAVLOV, P.Y. & PANIUKOVA, N.N. 1989. Biostratigrafia i vozrast otlogenij peschery Studyonoy na Verkhney Pechore (Biostratigraphy and age of the Studyonaya Cave deposits). Biostratigrafia Fanerozoia Timano-Pecherskoy provintsii. *Geological Institute Proceed¬ ings* 73:92-100. Komi Research Centre, Syktyvkar.

KANIVETS, V.I. 1964. *Kaninskaya peschera* (Kaninskaya Cave). Nauka, Moscow.

KOSINTSEV, P.A. & BORODIN, A.V. 1990. Teriofauna vostochnogo sklona Severnogo Urala v pozdnem Pleistotsene i Golotsene (Teriofauna of the eastern slope of the northern Urals in the Late Pleisocene and Holocene). Fauna mlekopi-taiuschikh i ptits pozdnego pleistotsena i golotsena SSSR. *Zoological Institute Proceedings* 212:120-134. Nauka, Leningrad.

KUZMINA, I.E. 1971. Formirovanie teriofauny Severnogo Urala v pozdnem antropogene (The Northern Urals teriofauna formation in the late Anthropogene). Materialy po faunam antropogena SSSR. *Zoological Institute Proceedings* 49:44-122. Nauka, Leningrad.

MURYGIN, A.M. 1987. Drevneye sviatilische v Eshmesskoi peschere (An ancient sanctuary in Eshmesskaya Cave). *Materialnaya i dukhovnaya kultura naselenia Evropeiskogo Severo-Vostoka.* Syktyvkar., 1987:35-41.

OKLADNIKOV, A.P. & PETRIN, V.T. 1983. Paleoliticheskie risunki Ignatievskoy peschery na Yuzhnom Urale (Paleolithic drawings of Ignatievskaya Cave in the South Urals). In *Plasika i risunki drevnikh kultur,* edited by R. Vasilevskii, pp. 47-58. Institute of History, Philology and Philosophy, Novosibirsk.

PETRIN, V.T. 1987. Vkladyshevyi nakonechnik drotika epokhi paleolita (Paleolithic inset dart-head from the northern Urals), hi *Drevnosti Sibiri i Dalnego Vostoka,* edited by V. Larichev, pp. 63-68. Institute of History, Philology and Philosophy, Novosibirsk.

PROKOSHEV, P.A. 1935. Rajon reki Chusovoj (Chusovaia river area). Arkheologicheskie raboty Akademii na novostrojkakh v 1932-33. *Gosudarstvennaya academiya istorii materialnoy kulturi* 109:176-186. Akademia Nauk, Moscow-Leningrad.

ROGACHOV, A.N. & ANIKOVICH, M.V. 1984. Pozdnij paleolit Russkoj Ravniny i Kryma (The Upper Palaeolithic of the Russian Plain and Krym). In *Paleolit SSSR,* edited by P. Boriskovskii, pp. 162-271. Nauka, Moscow.

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BAR International Series 667
1997

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