

## UPPER PALAEOLITHIC SETTLEMENTS IN BURAN-KAYA 3 (CRIMEA, UKRAINE): NEW INTERDISCIPLINARY RESEARCHES OF THE LAYERS 5-2, 6-1 AND 6-2

The Crimean peninsula is situated in south-eastern Europe and is well known for its numerous Palaeolithic sites. However most of them date to the Middle Palaeolithic while Upper Palaeolithic sites are comparatively rare. In Crimea, within the exception of a few sites with destroyed cultural layers and workshops, there are only five stratified sites with settlements attributed to the Epigravettian: Siuren 1 (upper cultural layer), Adzhy-Koba (cultural layer 2), Wyshenne 2, Skalistyi rock-shelter (cultural layers V, VI, VII), Buran-Kaya 3 (cultural layers 5-2, 6-1, 6-2) (Fig. 1, a). The archaeological materials from Siuren 1 (upper layer) and Adzhy-Koba were excavated by G.A. Bonch-Osmolovski in the 1930's (Бонч-Осмоловский, 1934; Векилова, 1957; Трусова, 1940; Колосов, 19656). The Upper Palaeolithic layers of Skalistyi rock-shelter did not contain dense lithic assemblages and yielded only isolated animal bones (Cohen et al. 1996). In the open-air site Wishenne 2, an abundant lithic industry was found, but there were only isolated tools among them. No animal bone was found in this site (Яневич, 1992).

Buran-Kaya 3 demonstrates a unique Middle to Upper Palaeolithic stratigraphy of South-Eastern Europe, with an exceptional association of numerous stone and bone industries, faunistic assemblages, objects of mobiliary art and human remains, particularly in the layers 5-2, 6-1 and 6-2, attributed to the Epigravettian.

This paper presents the first results of recent investigations conducted on the bio-archaeological materials excavated in 2001 from the layers 5-2, 6-1 and 6-2 of Buran-Kaya 3. The main issues presented here are: 1/ Description of the stone and bone industries, the faunistic assemblages, the objects of mobiliary art and the anthropological remains, 2/ Preliminary restitution of the Palaeolithic subsistence and technical behaviours in the palaeoecological context of Crimea, and 3/ Comparison of cultural features with the Upper Palaeolithic context of East Europe.

### GEOGRAPHICAL AND STRATIGRAPHICAL CONTEXT

Buran-Kaya 3 is situated in the eastern part of the Crimea, in the middle basin of the Burulcha river, in the Belogorsk region (4 km southwards from the village Aromatne), on the limit between the mountains and steppe zones, in the deep valley of the river. The site is lying in a small partly collapsed rock-shelter oriented South-West. The rock-shelter is at present 5 m wide and about 3 m deep. The rear wall of the rock-shelter presents a karstic cave, at least 3 m long (Fig. 1, b), whose entrance was closed in the Neolithic time. All Palaeolithic layers (excluding E and D levels) extend into the unexcavated karstic cave.

The first sondage was done in 1990 by A. Yanevich and

the site was excavated during five field seasons by many specialists under the direction of A. Marks (Middle Palaeolithic and Early Upper Palaeolithic layers) and A. Yanevich (Upper Palaeolithic layers), on an area extending to 50 m<sup>2</sup> (Chabai, Monigal, Marks 2004).

The deposits in the Buran-Kaya 3 rock-shelter consist of lime rubble and lime sand and different proportions of loamy sediment, depending on the climate conditions governing the geologic layer deposition. The best stratigraphical profile was preserved near the rear wall of the rock-shelter (Fig. 1, b). Twelve cultural layers were uncovered, spanning a time period from the Middle Palaeolithic to the Middle Ages (Monigal 2004b). Epigravettian in the stratigraphical profile of Buran-Kaya 3 is represented by the cultural layers 5-2, 6-1 and 6-2 (Fig. 1, b).

The Buran-Kaya 3 rock-shelter is characterised by a very slow sedimentation process (Чабай, 2004а, с. 26-27). Therefore, the deposits were "pressed". The archaeological stratigraphy contains no sterile horizons and the cultural layers were defined only by the lithological features. Most cultural layers contain a very high number of artefacts and undoubtedly a series of palimpsests. Only isolated dwelling structures have been recognised by the remains of a hearth in layers 6-1 and another one in 6-2.

### GEOCHRONOLOGY AND PALEOENVIRONMENT

The published AMS <sup>14</sup>C dates have shown inconsistencies and ambiguities concerning the Upper Palaeolithic sequence (summarized in Monigal 2004b). One date of 30740±460 BP (OXA-6882) is attributed to layer 6-2 (Pettitt 1998). Nevertheless, the lithic industry recovered from this layer is attributed to the Epigravettian, which is not known to be so ancient. The lack of correspondence between the radiocarbon date and the expected age of the 6-2 layer requires further analyses, especially new <sup>14</sup>C dates and biogeochemical analyses, which are currently in progress, on samples of accurately identified faunal and human remains.

The results of both palynology and micro-mammal study indicate a general steppe landscape and a similar diachronic tendency. From the layer 6-2 to 5-2, there is an important cooling episode and the environment becomes dryer and more desertic (Table 1).

The latest study of the large mammal remains from layers 5-2 and 6-1 (see below in this paper) suggests an open environment with a greatly reduced tree cover, with cold and dry climatic conditions

According to Gerasimenko (2004), the base of the level 6-1 could be correlated with the Lascaux Interstadial due to the more temperate condition. Conversely, according to the micro-mammal data, Markova (2004a) suggests that

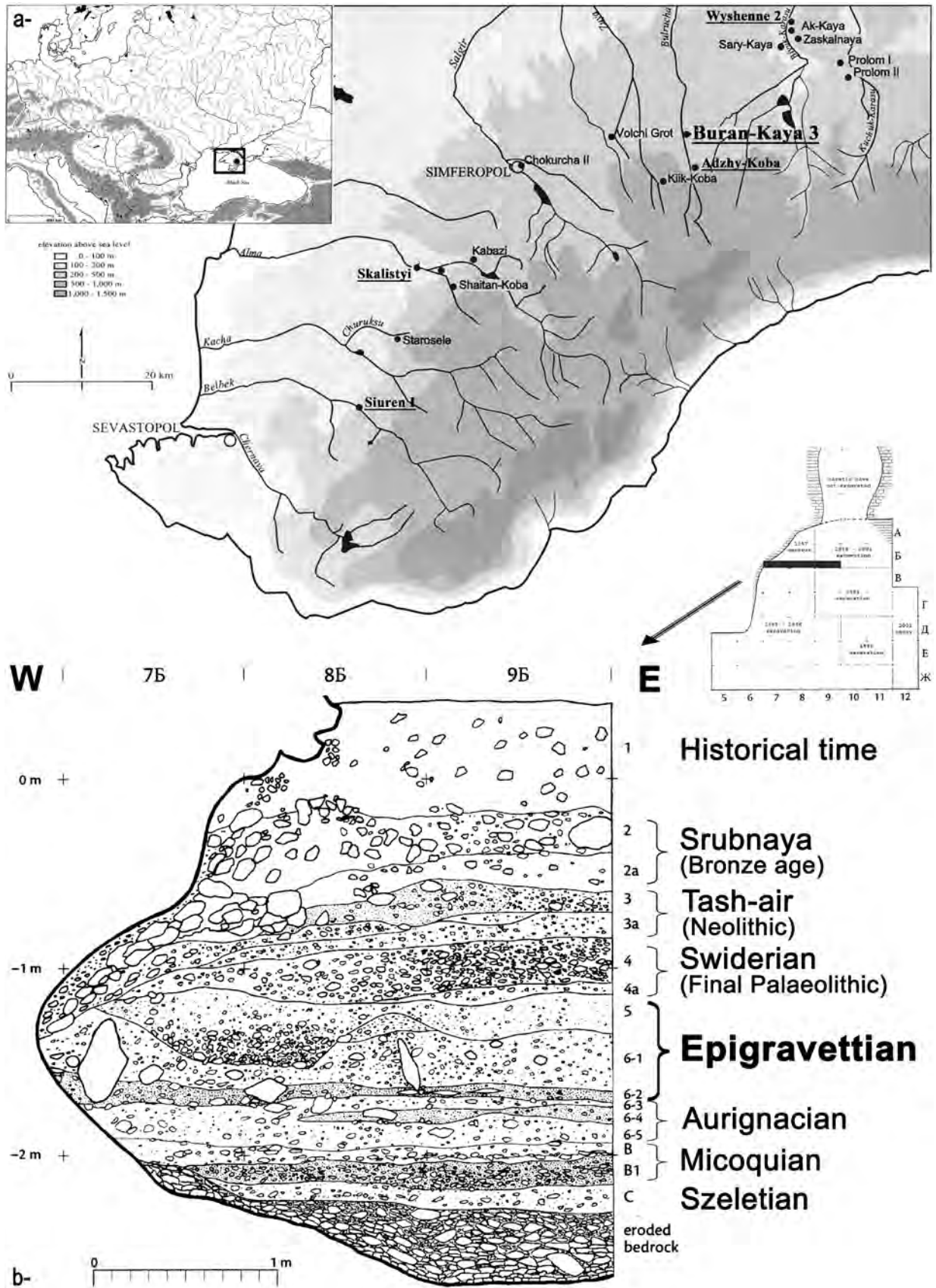


Figure 1: a – Geographical situation of Buran-Kaya 3 and the other Palaeolithic sites of Crimea, Ukraine (modified after Ferring, 1998). b- Stratigraphy of Buran-Kaya 3 (Monigal, 2004b – drawing A. Yanevich 1996) and plan of the 2001 excavation (modified after Monigal, 2004b).

**Table 1:** Synthesis of palaeoenvironmental studies of the layers 5-2, 6-1 and 6-2 at Buran-Kaya 3 (after Gerasimenko 2004 and Markova 2004a).

	6-2	6-1		5-2
<b>Palynology</b>	Forest-steppe / Meadow-steppe	Forest-steppe / Meadow-steppe	Grass-steppe / Dry-steppe	Dry-steppe
<b>Micromammals</b>	Steppe and semi-desert	Steppe and semi-desert / Dryer condition		Steppe and semi-desert / Presence of water near the site

level 6-1 could be attributed to the last Valdai maximum. Further zooarchaeological analyses and radiocarbon dates already in progress should shed new light upon this chronological issue.

#### LARGE MAMMAL ASSEMBLAGES

The initial results of the zooarchaeological study, presented here, focus on the identified bones from the upper part (the first 3 stripping horizons) of layer 6-1 and the entire layer 5-2, excavated in 2001. On the whole, including the unidentified specimens, the levels 6-1 and 5-2 yielded more than 120000 faunal remains from the 6 m<sup>2</sup> area excavated in 2001 (Table 2).

**Table 2:** Quantification of the large mammal remains from the layers 5-2 and 6-1 (3 upper stripping horizons) of Buran-Kaya 3 (NISP: Number of Identified Specimens; NID: Number of Not-Identified remains).

	NISP	% NISP	NID	% NID	TOTAL
<b>Layer 5-2</b>	<b>304</b>	<b>1,57%</b>	<b>19 601</b>	<b>98,43%</b>	<b>19 905</b>
<b>Layer 6-1 (upper 3 horizons)</b>	<b>312</b>	<b>1,14%</b>	<b>27 031</b>	<b>98,86%</b>	<b>27 343</b>

#### Taphonomy

The taphonomic study was conducted on the whole assemblage. The bones are very fragmented but the cortical surfaces are quite little altered. Only the first stages of weathering are represented by a few fissurations and exfoliation of the cortical bone surfaces. We observed many traces of oxide deposition mainly due to manganese and iron (on more than 50 % of the bone fragments). Marks of water dissolution are seen on less than 10 % of the bones. Few additional climato-edaphic processes are visible. The extreme fragmentation of the material (more than 90 % of the bone fragments are less than 2 cm long) can be largely explained by post-depositional breakage.

The main non-anthropogenic biological agents affecting the faunal material, especially those from hare and saiga antelope, are carnivores, mostly small canids. An important difference concerns the stratigraphic distribution of this action, as about 8 % of the layer 5-2 bone material presents gnawing or bite marks (likely caused by hyaenas) whereas less than 2 % of the underlying layer 6-1 assemblage

possesses such modifications. Marks left by vegetation on the bone material (root etching) never exceed 5 % of the total material.

In these archaeological levels, humans are the main agent responsible for the accumulation of the faunal material. A significant portion of the material exhibits the residues from combustion activities (27 % in 6-1 and 16 % in 5-2). Furthermore, a significant number of long bone fragments (longer than 2 cm) exhibit helicoidal fractures typical of fresh bone breakage, partly due to humans. Other anthropic activities, such as butchery, are comparatively sparse, partly due to the fact that bone fragmentation limits the observation of traces.

This first taphonomic approach (additional spatial analyses are currently in progress) leads us to consider that the deposition processes of both cultural layers have a similar history. Bones seem to have been rapidly buried in a mainly cold environmental context, in spite of the relative humidity at the bottom of the valley. The presence of carnivore activity at this site appears to be more significant in the layer 5-2 than in 6-1.

#### Faunal spectrum

The faunal spectra (Table 3, Fig. 2) show a predominance of small-sized mammals: saiga antelope (*Saiga tatarica*), red fox (*Vulpes vulpes*), polar fox (*Alopex lagopus*) and hares (*Lepus* sp.), in terms of the Number of Identified Specimens (NISP) as well as Minimum Number of Individuals (cMNI). Hares seem to be less abundant in layer 5-2 than in 6-1. Large-sized mammals are only represented by a few bones of equids (*Equus hydruntinus* and *Equus caballus*) and bovines (*Bovinae*), mainly in the layer 6-1 for the latter. Equids are better represented in layer 5-2 than in 6-1. Cervids are only represented by a few remains in each level. Large-sized carnivores appear in the assemblages however only represented by single individuals for each taxon: bear (*Ursus* sp.), wolf (*Canis lupus*) and cave hyaena (*Crocota crocota spelaea*). On the contrary, foxes (or *Vulpinae*: *Vulpes vulpes* and *Alopex lagopus*) are very well represented by relatively complete skeletons corresponding to several individuals.

From the palaeoecological point of view, the faunal spectra of both layers 6-1 and 5-2 indicate an open environment with a much reduced tree covers: the low representation of cervids and high presence of equids and bovines. The climate appears to have been mainly cold and dry (saiga antelope) in spite of the presence of several small carnivores (mustelids), which indicates the existence of a more humid place near the site, probably at the bottom of the valley.

#### Acquisition of the main species

In both layers, saiga antelope is clearly the most attractive species for the Palaeolithic occupants of the site, predominating in terms of NISP (about 30 %) and MNI. Juvenile and adult animals have been identified. A young saiga antelope seems to have been killed during the warm season in 5-2. The generally good preservation of cranial elements and those of the autopodia has been observed (Fig. 2, b). On the contrary, there are a significant low proportion

**Table 3:** Faunal spectrum of the layers 5-2 and 6-1 (3 upper stripping horizons) at Buran-Kaya 3.

TAXON	Layer 6-1 (upper horizons 1 to 3)				Layer 5-2				
	NISP	%NISP	cMNI	%cMNI	NISP	%NISP	cMNI	%cMNI	
Equidae	<i>Equus hydruntinus</i>	–	–	–	–	8	2,6	2	9,1
	<i>Equus caballus</i>	–	–	–	–	7	2,2	2	9,1
	n.d. Equid	33	10,6	1	6,3	12	3,8	–	–
Bovidae	Bovines	13	4,2	1	6,3	1	0,3	1	4,5
	<i>Saiga tatarica</i>	101	32,6	3	18,8	93	29,8	3	13,6
	Small Bovid	4	1,3	–	–	–	–	–	–
Cervidae	<i>Cervus elaphus</i>	1	0,3	1	6,3	6	1,9	1	4,5
	<i>Rangifer tarandus</i>	1	0,3	1	6,3	4	1,3	1	4,5
	Very large Cervid	1	0,3	–	–	–	–	–	–
	n.d. Cervid	5	1,6	–	–	3	1	–	–
Ursidae	<i>Ursus sp.</i>	1	0,3	1	6,3	1	0,3	1	4,5
Hyaenidae	<i>Crocuta crocuta spelaea</i>	–	–	–	–	3	1	1	4,5
	Large carnivore	5	1,6	–	–	–	–	–	–
Canidae	<i>Canis lupus</i>	3	1	1	6,3	15	4,8	1	4,5
	<i>Alopex lagopus</i>	12	3,9	1	6,3	12	3,8	2	9,1
	<i>Vulpes vulpes</i>	11	3,5	1	6,3	4	1,3	1	4,5
	n.d. fox	55	17,7	1	6,3	61	19,6	–	–
Mustelidae	Mustelid	1	0,3	1	6,3	7	2,2	3	13,6
	Small carnivore	17	5,5	–	–	–	–	–	–
Leporidae	<i>Lepus sp.</i>	46	14,8	3	18,8	50	16	2	9,1
	Large rodent (cf. <i>Marmota</i> )	–	–	–	–	23	7,4	1	4,5
	<b>TOTAL</b>	<b>312</b>	<b>100,0</b>	<b>16</b>	<b>100,0</b>	<b>304</b>	<b>100,0</b>	<b>22</b>	<b>100,0</b>

of the elements associated with the axial skeleton. Bones are present in similar proportions in both layers, with the exception of long bones which are more abundant in 6-1. The traces of anthropic activities on bones result from skinning, meat filleting and marrow extraction.

With regards to the two fox species (red and polar fox), young and adult individuals have been identified. The skeletal preservation of these small canids is similar between the two layers (Fig. 2, c): all elements of the skeleton (including the axial part) are well represented. The intrusive origin of the fox remains at the site after the human occupation episodes cannot be excluded.

*Leporidae* is the third main mammal family represented within this deposit, and are present in the same proportions as small canids (Fig. 2, d). The bone preservation of hares is similar to those of the foxes with however a lower rated preservation of the dental remains and the autopodia. This may indicate that hare pelts were removed from the site. Traces of consumption on hare remains by humans and small carnivores are visible.

The low number of elements attributed to other large mammals did not permit us to obtain additional palaeontographical information at present. However it has been observed that, in 5-2, there are teeth from two young horses (approximately 10 and 15-18 months old), which suggest that their slaughter would have taken place during the cold season.

#### LITHIC INDUSTRY

The lithic assemblages from the Epigravettian layers recovered during the 2001 excavations are quite dense: 3490 artefacts in the cultural layer 5-2, 23650 in 6-1 and 2689 in 6-2. All lithic inventories are similar and will be considered together in this article.

The predominant raw material of the stone artefacts is a high-quality flint, which is black or grey in colour, and, to a lesser extent, a low-quality flint of brown and light grey colour. The sources of all flints are found 10 to 20 km away north and north-east from the site, in the Burulcha valley, the Kara Kush Mountain and the Biyuk Karasu valley.

The blade processing of the Buran-Kaya Epigravettian is based on the use of mainly prismatic cores with one striking platform and narrow flaking surfaces (Fig. 3, 1-4). Prismatic multiplatform cores were used too (Fig. 3, 5, 6). The quantity and location of striking platforms and flaking surfaces of these cores are varied. However, striking platforms and flaking surfaces are situated only on the narrow sides of the preforms. The formation of secondary and tertiary striking platforms was connected with different artisan errors (errors of manufacture) on the primary platform. These platforms were specially made because it was impossible to get necessary blanks from the main platform and the work surface, also for the optimal use of materials. Multiplatform cores are generally smaller than exhausted cores with good

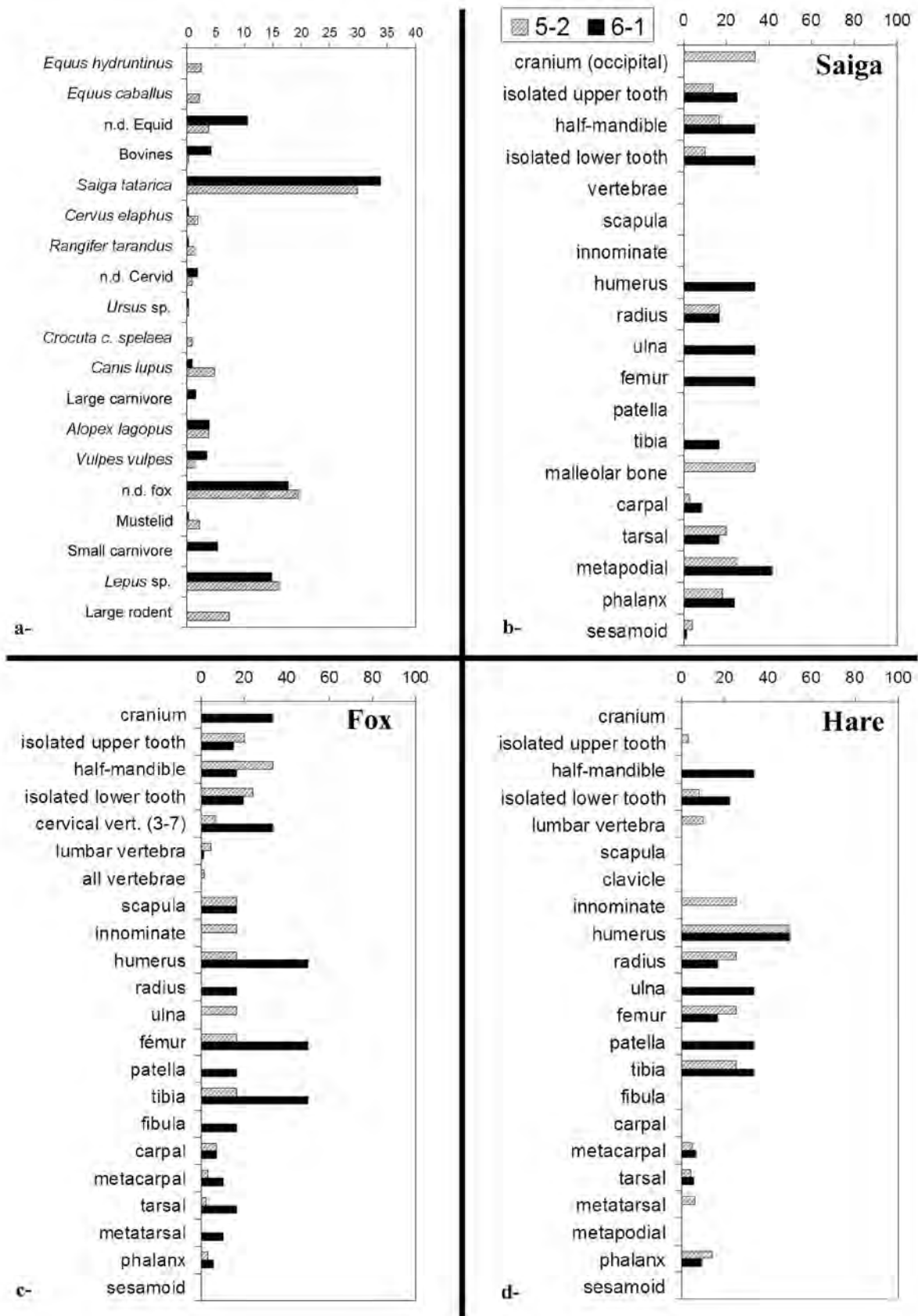


Figure 2: Faunal remains from the layers 5-2 and 6-1 (3 upper stripping horizons) of Buran-Kaya 3. a – Faunal spectrum (% NISP); b – Bone preservation (Ps) of Saiga antelope; c – Bone preservation (Ps) of Polar and Red Fox; d – Bone preservation (Ps) of Hare. (NISP: Number of Identified Specimens; Ps: Percentage of survival)

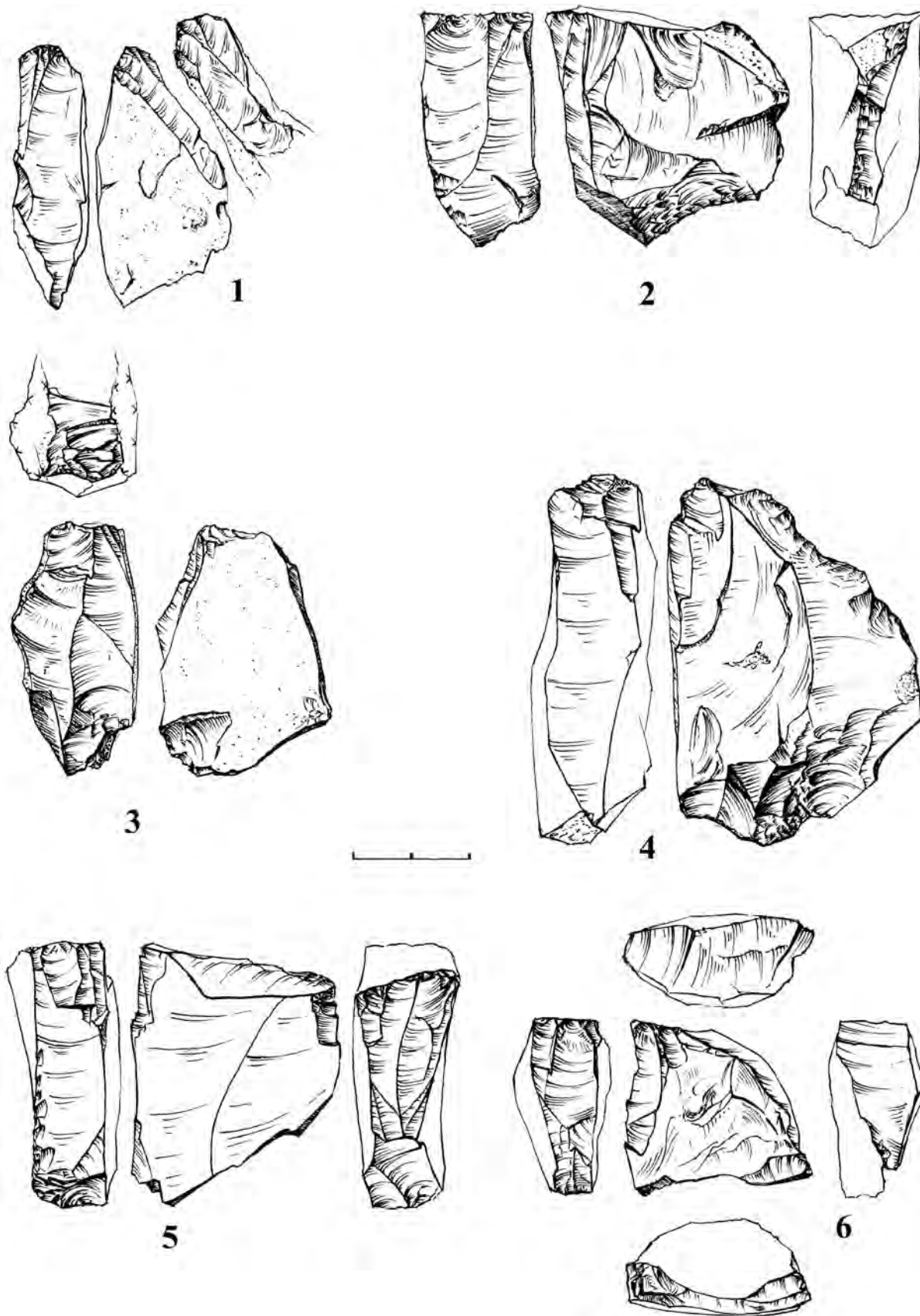


Figure 3: Buran-Kaya 3, layer 6-1, cores.

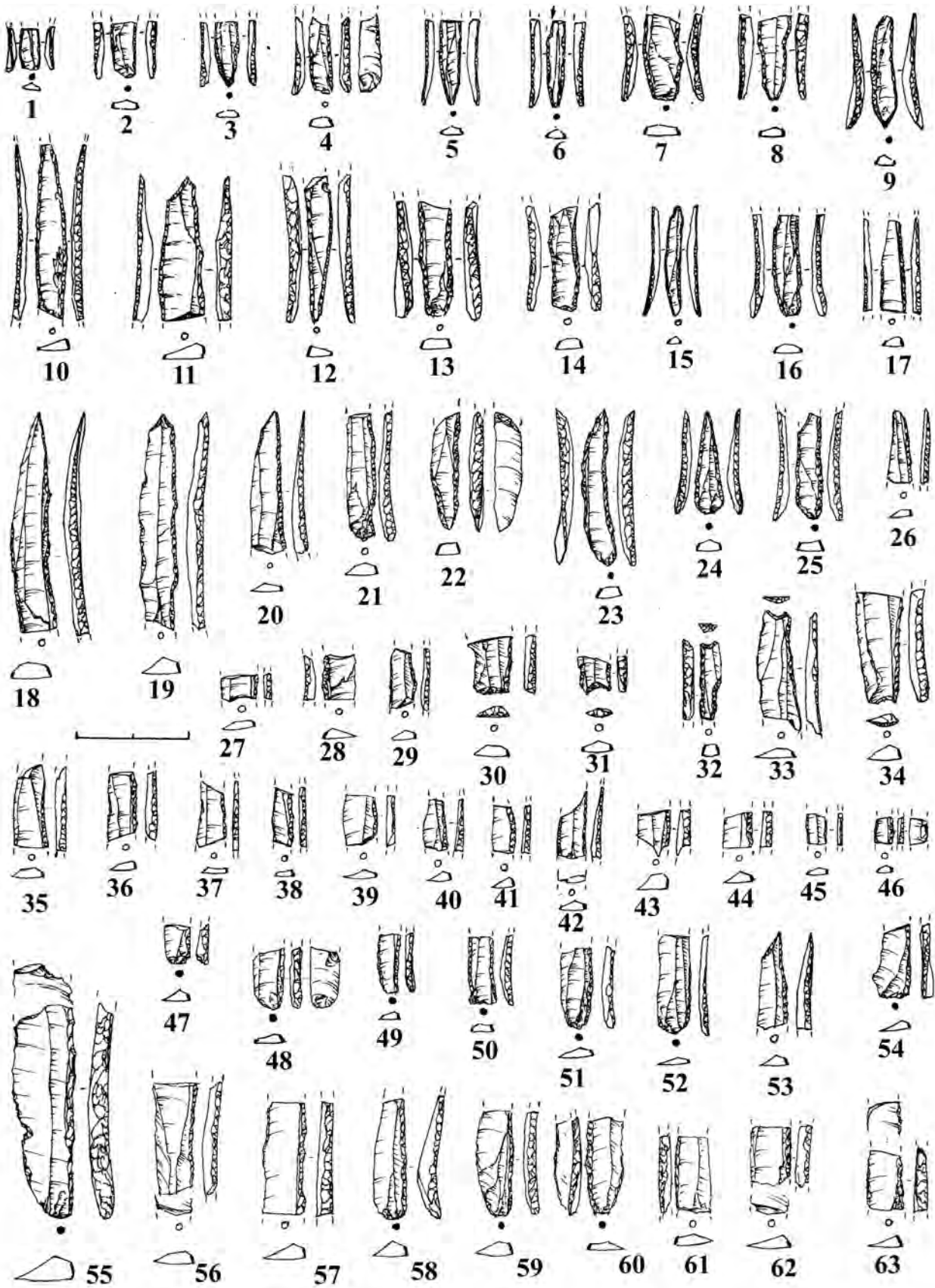


Figure 4: Buran-Kaya 3, layer 6-1, microliths.

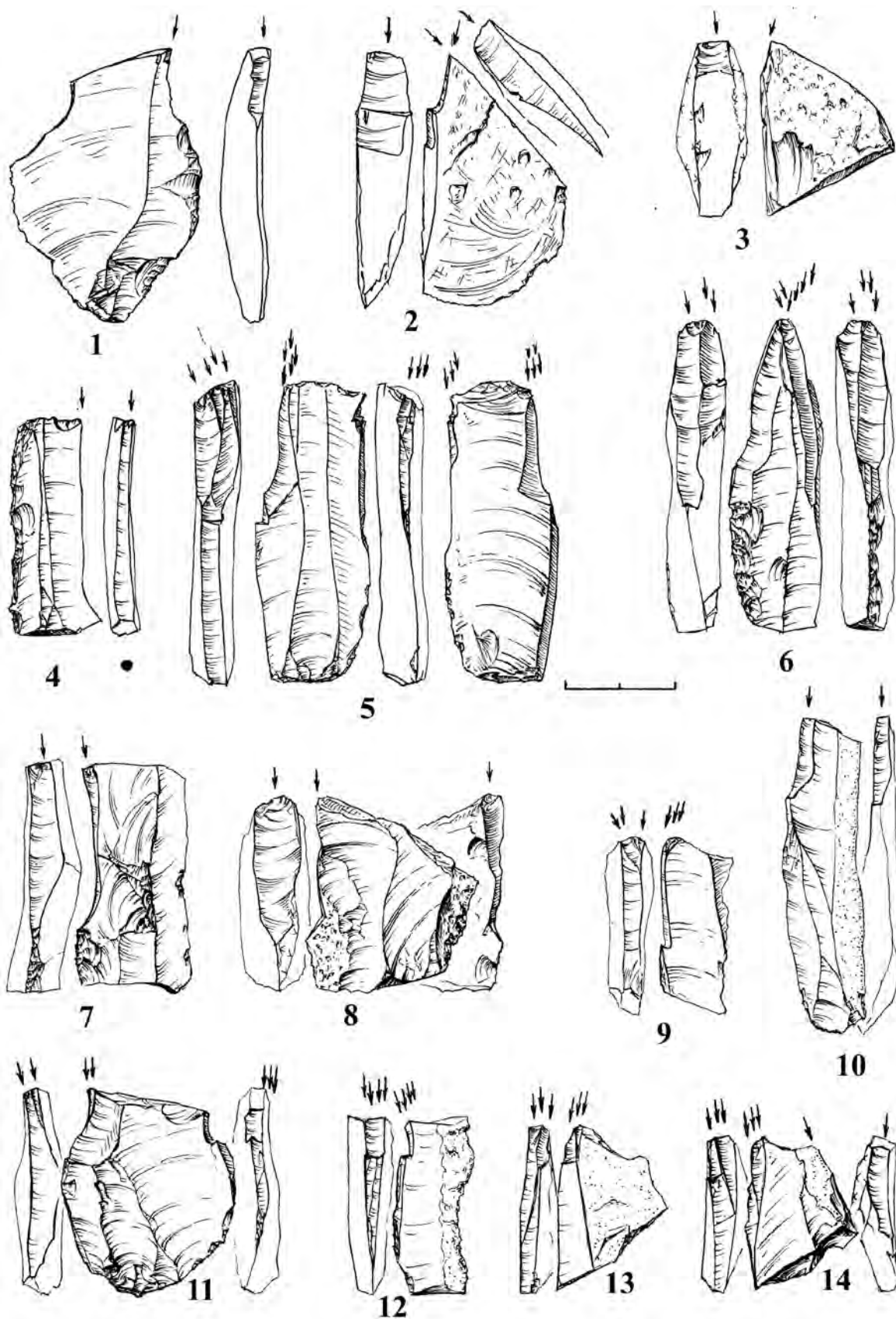


Figure 5: Buran-Kaya 3, layer 6-1, burins.



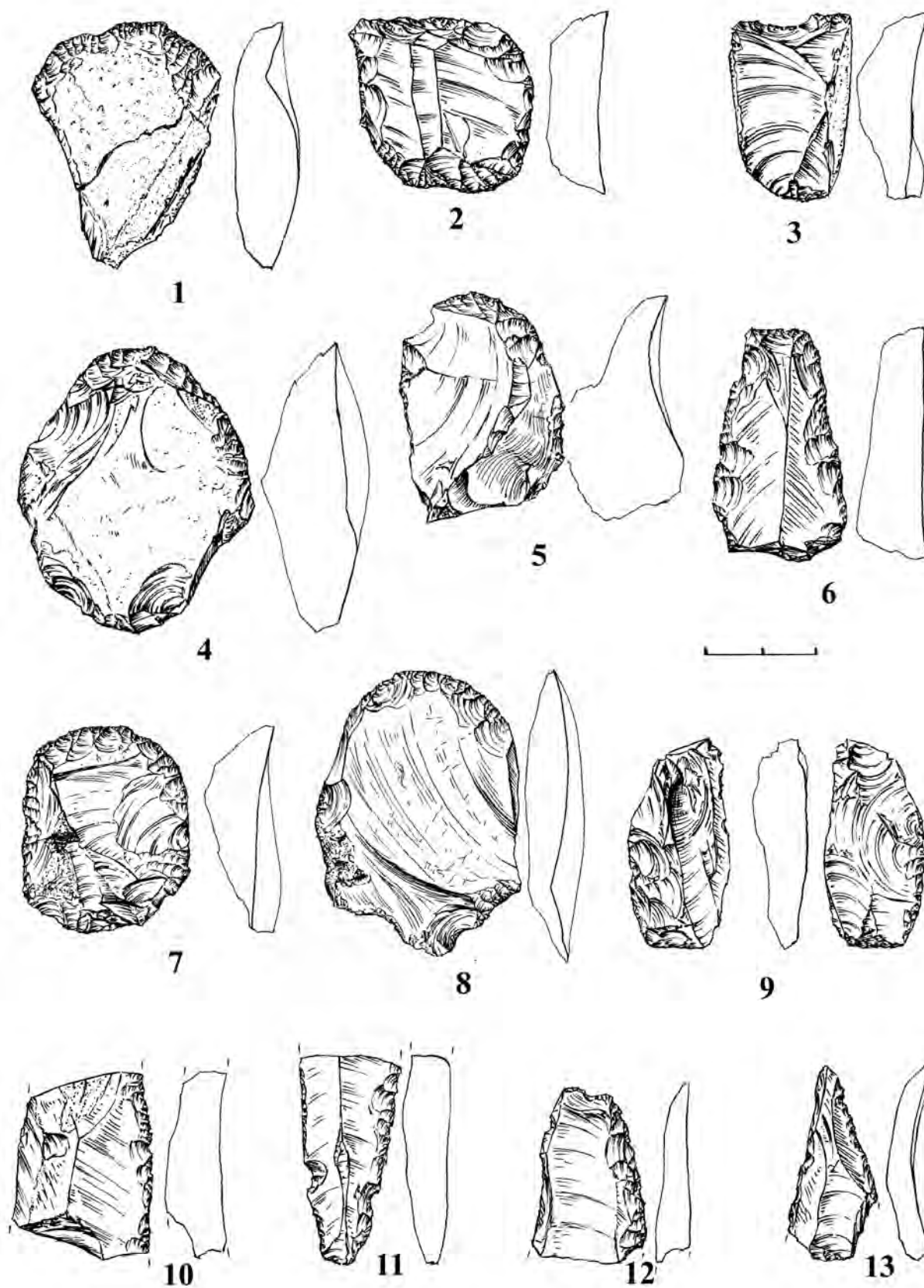


Figure 6: Buran-Kaya 3, layer 6-1, scrapers.

prepared versant sides. With this in mind, the multiplatform cores are the variant of cores with one striking platform and narrow front. Fracture zones were only prepared through retouch during the process of core reduction. As a result, most cores of Epigravettian layers in Buran-Kaya 3 demonstrate very homogenous blade processing technology.

The relative proportion of tools within the total lithic inventory is 3.2 % for the layer 5-2, 3.7 % for 6-1 and 5.1 % for 6-2.

A striking feature of these three Epigravettian assemblages of Buran-Kaya 3 consists of a very high proportion of backed microliths in the tool kit: 77.1 % in the layer 5-2, 87.2 % in 6-1 and 74.6 % in 6-2. There are an unusually high proportion of different points among the microliths, which represent more than half of the total number of the microliths. These are numerous bilateral (Fig. 4, 1, 2, 4, 7, 9, 13-17, 25, 26, 50) and convergent (Fig. 4, 3, 5, 6, 8, 10, 11, 12, 23, 24) backed points with retouch on both sides and a comparatively small proportion of microgravettian points (Fig. 4, 18, 19, 20, 21, 22, 53, 55, 58, 59, 60). The other microliths are represented by isolated rectangles (Fig. 4, 30-34) and numerous backed bladelets (Fig. 4, 26, 27, 28, 29, 35-49, 51, 52, 54, 56, 57, 61, 62, 63). The retouch of the microliths is exclusively semi-abrupt and abrupt. The height of the retouch is less than 3 mm; it is usually calibrated between 1 and 2 mm. The angle of retouch is not very steep, between 60° and 85°. Ventral retouch was never employed in the production of the microliths.

Burins are more frequent than end-scrapers. They were produced almost equally from flakes and blades. Among them, angle burins dominate (Fig. 5, 1-4, 7-14). The burins on truncations (Fig. 5, 5) and the dihedral burins (Fig. 5, 6) are also quite abundant. Many of them have multiple working edges (Fig. 5, 5, 6, 11, 14).

Among scrapers, the simple end-scrapers predominate and were produced from blades as well as from flakes (Fig. 6, 1, 3, 5, 7, 8). In addition, there are isolated double-end type scrapers (Fig. 6, 2, 6) and semicircular scrapers (Fig. 6, 7). In the lithic inventory of layers 6-1 and 6-2, *pièces esquillées* are also present (Fig. 6, 9). Furthermore, many flakes and blades exhibit retouch, with a few of blades bearing Aurignacian retouch (Fig. 6, 10, 11, 12).

#### BONE INDUSTRY

The cultural layers 5-2, 6-1 and 6-2 have yielded a total of 32 bone tools since the beginning of the excavations, many of which are fragmented. Among the tools with a clear function, 2 arrow heads, 5 projectile points and 4 awls have been identified.

The arrow heads (Fig. 7, 9, 10) measure about 3.5 cm in length and maximally 0.5 cm in thickness, they bear a completely worked surface, a round or a slightly oval cross section and a specially worked base for the arrow shaft.

Spear points (Fig. 7, 23-26, 29) are represented by fragments with almost parallel sides, 1.4 to 0.7 cm wide, and

with complete or, in one case, partially (Fig. 7, 29) worked surfaces, and with exact oval cross sections.

Awls are made from fragments of long bone which were still partly kept with their joint ends. They exhibit only simple cross sections in the worked distal part, mostly roundish or oval in section (Fig. 7, 28, 31). The function of one tool, which is made of a large fragment of long bone (Fig. 7, 27), is difficult to determine. It may be an awl; however this artefact presents worked sides on its whole length and may be a projectile point.

The remaining bone tools are small distal fragments of points, most of which bear carefully worked surfaces and round cross sections, and maybe broken arrow heads (Fig. 7, 1-4, 8, 12, 14, 20). A few very thin fragments with parallel sides may represent the fragments of needles (Fig. 7, 11, 13, 16, 17). Finally, a few fragments have clear oval cross sections, and possibly represent parts of projectile points or awls (Fig. 7, 5, 6, 7, 15, 18, 19, 21, 22).

These tools are mainly made of bones, such as ribs, metapodials (from horse and cervids) and long bones, and antler (probably from reindeer). Most of them were broken as they were used as tools. One artefact, which is made of a long bone (Fig. 7, 30), seems to have been used as a matrix to extract a needle. Some of these tools could have been produced *in situ* (needles, points) but a lot of them (especially those from antler) seem to have been imported from another site of production.

#### SHELLS AND OSSEOUS PERSONAL ORNAMENTS

Since the beginning of fieldworks at Buran-Kaya 3, the ornaments excavated from the layers 5-2, 6-1 and 6-2 consist of perforated mollusc shells, fox and red deer teeth, perforated mammoth ivory pendants and a thin blade of mammoth tusk ivory with "meander" ornaments.

##### Mollusc shells

A total of 60 fresh water (*Theodoxus* sp., Fig. 8a, 6-18) and marine shells (*Nassa* sp., Fig. 8a, 1-4, and *Cyclope* sp., Fig. 8a, 5), were recovered. Many of them are not specifically identifiable due to their poor state of preservation.

In the layer 5-2 only 7 shells of *Theodoxus* sp. were found (5 of which were perforated).

The molluscs from the layer 6-1 belong to different species: mainly shells of *Theodoxus* sp. (35 pieces, 25 with hole, 3 without, 7 fragments); a few *Theodoxus fluviatilis* L. and *Theodoxus* cf. *danasteri* Lindholm, 1908; 6 shells of *Cyclope* sp. (5 with a hole, 1 fragment), 5 perforated shells of *Nassa* sp. and 1 fragment of *Lithoglipus* ex gr. *Piramidatus* Mollendorf, 1873.

The shells from the layer 6-2 are not abundant: 5 shells of *Theodoxus* sp. (4 with a hole and 1 without) and 1 perforated shell of *Cyclope* sp.

Among the shells recovered from Buran-Kaya 3 there are: *Theodoxus* sp., including *Theodoxus fluviatilis* L. and *Theodoxus* cf. *danasteri* Lindholm, 1908, as well as *Lithoglipus* ex gr. *Piramidatus* Mollendorf, 1873, they

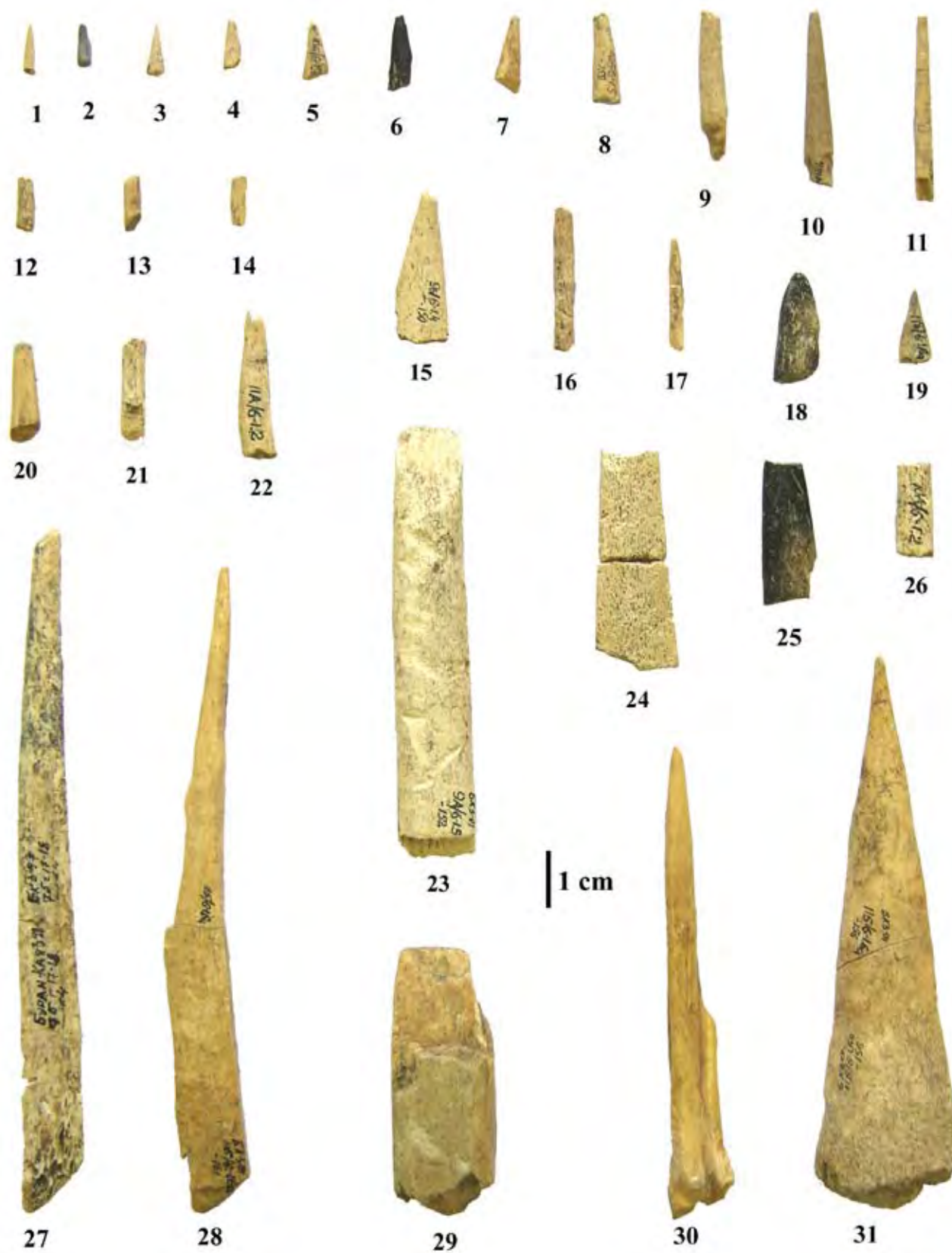


Figure 7: Buran-Kaya 3, layers 5-2, 6-1 and 6-2, bone industry.

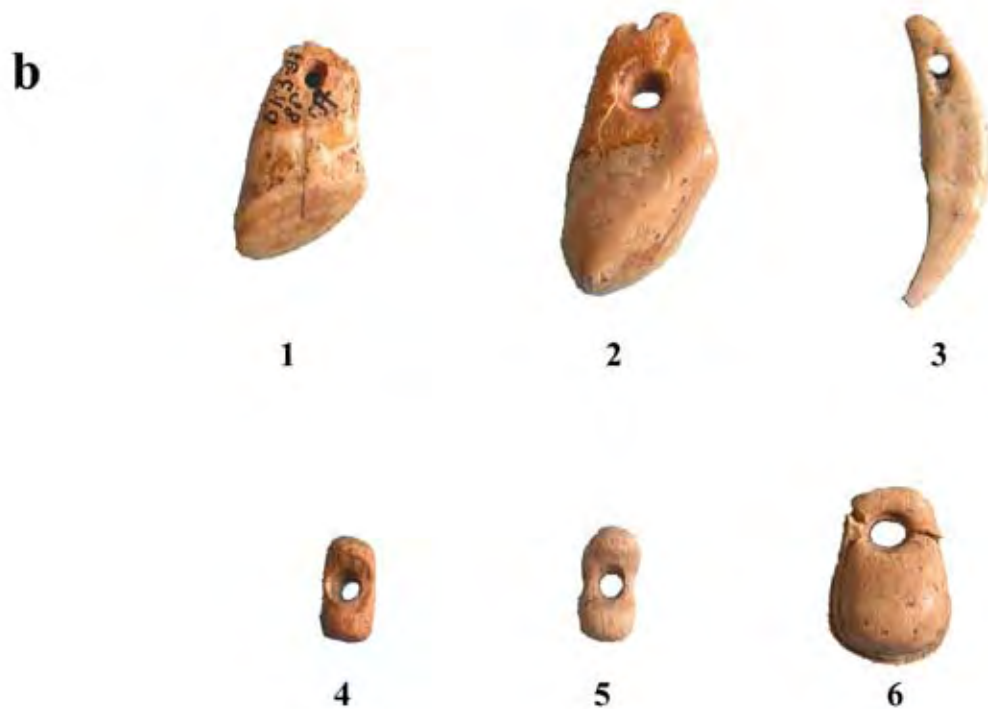
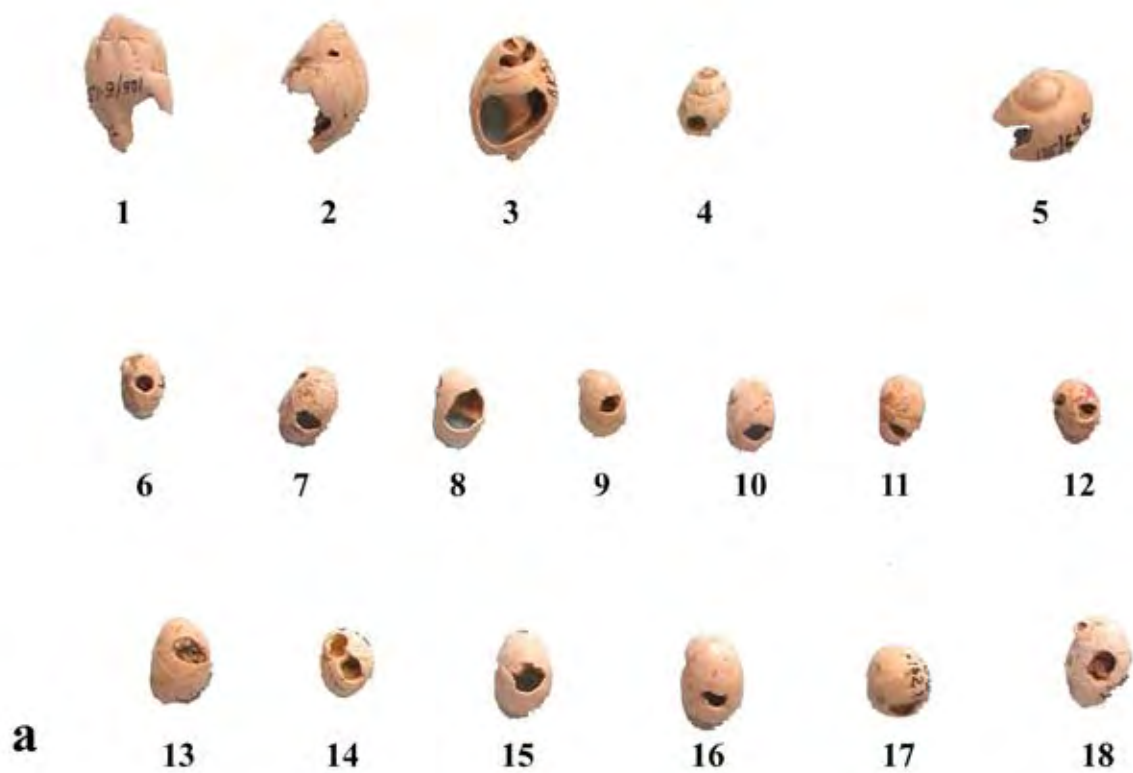


Figure 8: Buran-Kaya 3, layers 6-1 and 6-2, pendants: perforated shells (a), mammal teeth and mammoth tusk ivory beads (b).

spread in wide areas of the European rivers, particularly in southern Ukraine. *Cyclope* sp. and *Nassa* sp. are marine species and are well represented in the Black Sea.

#### **Mammal teeth**

Perforated teeth include two upper canines of red deer (*Cervus elaphus*), from layer 6-2, and one upper canine of polar fox (*Alopex lagopus*) from layer 6-1 (Fig. 8b).

The fox tooth is a right upper canine belonging to an adult individual. The root is partially broken. The perforation was achieved by means of successive scratching of splinters up to the drilling of the root (Taborin 1977).

The largest red deer tooth is a right upper canine from an adult male. Well preserved, it presents one complete perforation and probably another one broken. The remaining part of the second perforation is very round; this may suggest the abandonment of the first perforation during the shaping of the object or re-use of the tooth after breakage due to its utilisation by suspension. The preserved perforation is biconical and it was made by rotation. In its inner surface the residues of a red colouring agent have been observed. On the tooth crown, two short and parallel notches are also present (Fig. 8b).

The second red deer tooth is also a right upper canine from a male individual, somewhat smaller than the other one. It also bears a circular perforation made by alternate rotation and the broken remains of a secondary system of attachment. Inside the perforation, there are also traces of red pigment.

#### **Mammoth ivory**

The four beads found at the site (layers 6-1) are made from mammoth tusk ivory: one is shaped like a "teardrop" and three are bilobate in form (2 complete and 1 fragmented). They are covered by sediment which limits the observation of the perforation. The teardrop-shaped bead (length 15.0 mm, width 10.2 mm, thickness 2.4 mm) gets a proximal perforation and is split up into five associable bladelets. The bilobate beads (one is 10.8 mm long and 5.7 mm wide) have a central, circular and biconical perforation. They are complete and in a very good state of preservation. The perforation, however, still contains sediment. The general shape of these beads matches White's (1999) hypothesis of stringed pattern (*agencement engrené*), as they fit to each other.

On a very fragile ivory blade, in splitting progress, preserved with a lot of sediment, we observed fragments of a decoration reminding meanders, constituted by opposite parallel incisions.

### HUMAN REMAINS

Some human remains have been discovered in 1994 (7 teeth) and 2001. We present in this paper, the remains from the six square-meters excavation undertaken in this site by Alexander Yanevich in 2001. They are located into three different levels: 5-2, 6-1 and 6-2 but the majority comes from level 6-1. In total, 167 skeletal remains are allocated to the genus *Homo*, most of them being highly fragmentary.

#### **Inventory**

The representation of skeletal elements is unexpected and consists mostly of cranial (n=116) and dental (n=35) remains. The postcranial skeleton is represented by only sixteen remains and consists of rib fragments and phalanxes. The anatomical distribution of the cranial remains is also particular with the presence of only one maxillo-facial remain, three fragments of mandible, contrasting with an abundance of frontal, parietal, temporal and occipital bones fragments (Fig. 9).

#### **Minimal number of individual, age at death and sexual attribution**

None of the teeth from the levels 5-2, 6-1 and 6-2 are found with their associated jaws. It is also difficult to determine some association between the cranial and dental remains. However, an estimate of the minimum number of individuals can be done on the dental material. The MNI is based on the wear status, the estimation of dental development, position of the enamel hypoplasia, and repeated teeth. Based on these observations of the 35 dental remains found in 2001, the minimum number of individuals is 7. One individual, a juvenile, comes from the layer 5-2. Five individuals are located in layer 6-1. They represent four different developmental age groups: juvenile, subadult, adult and old adult. One subadult individual comes from layer 6-2.

The sexual diagnosis of these specimens is not possible due to the absence of any pelvic bones, which are crucial for the determination of sex.

#### **Disease**

Enamel hypoplasia has been observed on several different teeth. The enamel hypoplasia is a defect of tooth enamel which results of a low quantity of enamel compare to the normal. It is a developmental defect related to generalised disturbances. The observation of this pathology can be interpreted, in this case, as a sign of nutritive stress.

#### **Taxonomic determination**

With regards to the taxonomic assignment, it can be made on only a few complete bones and teeth with good state of conservation. Preliminary investigations demonstrate that the dental remains exhibit traits which occur more frequently in anatomically modern humans than in other humans (i.e. Neanderthals) such as the lack of a well-developed mid-trigonid crest, and no large anterior fovea on the lower molars. Furthermore, it can be mentioned the lack of shovelling and labial convexity, and a lack of any well-developed lingual tubercles on the maxillary incisors. The co-occurrence of these traits (absent in the human remains from Buran-Kaya 3) distinguishes Neanderthals from anatomically modern humans (Bailey & Hublin 2005; Bailey 2006).

### DISCUSSION AND CONCLUSION

The stone industry of the layers 5-2, 6-1 and 6-2 in Buran-Kaya 3 demonstrates relatively long-term occupa-

tions of the site. There are full cycles of flint usage with completely used cores and a high proportion of debitage, as well as the production and refreshment of tools and the va-

skinning, filleting and marrow extraction activities have been observed on the bones. The first stages of butchery probably took place elsewhere, in another location (at the front part of



Figure 9: Examples of human remains from Buran-Kaya 3. From left to right, (up): lower molar, occipital bone; (bottom): mandible, phalanx. Scale = 1cm.

riety of tool classes. Other residential indicators are demonstrated by different objects: presence of personal ornaments, bone tools and intensive use of ochre.

Conversely the inferred subsistence activities and the absence of *in situ* production of osseous artefacts (industry and ornaments) rather refer to short-termed settlements.

The faunal remains found in layers 5-2 and 6-1 are extremely split up and can be attributed to only a few individuals. Four species predominate: saiga antelope, common fox, polar fox and hare. These taxa are accompanied by equids and carnivores. This faunal spectrum characterises an open environment of cold and dry steppe.

The subsistence human activities in the study area, the rear part of the rock-shelter, seem relatively modest and do not show the complete *chaîne opératoire* of butchery. Only

the rock-shelter?) or even another site. Furthermore, there is a high usage of bone as fuel within the site, which could be explained by a very cold environmental context with rare plant resources and/or by activities of preparation of meat and fat broth (*bouillon gras*).

The proportion of artefacts from osseous raw material (bone industry and other objects in bone, ivory or shell) is quite small in the layers 5-2, 6-1 and 6-2 of Buran-Kaya 3. Except the occurrence of a few bone supports used to produce needles, these osseous artefacts, which are mainly weapons, seem to have been all imported as already produced objects (manuports), and then broken during their usage. These features suggest short-term and recurrent settlements and are zooarchaeologically considered typical of a temporary hunting camp.

One of the main distinguishing features of the stone industries from the layers 5-2, 6-1 and 6-2 in Buran-Kaya 3 is the comparatively large amount of microliths, which takes a central place in the discussion regarding the function of the Epigravettian settlements. These artefacts were used as parts of different projectile points and represent about 80 % of the whole tool assemblage among all 3 Epigravettian layers. This high proportion of microliths is typical for all Upper Palaeolithic of Crimea: 56 % of the inventory in the Epigravettian upper layer at Siuren 1 (Векилова, 1957); 58.9 %, 67.6 % and 47.4 % in the Aurignacian layers of Units H, G and F at Siuren 1 (Demidenko, Otte 2001, p. 133-146); 60.2 %, 65.7 % and 67.0 % in the late Aurignacian layers 6-3, 6-4 and 6-5 at Buran-Kaya 3.

Among the Upper Palaeolithic sites of Crimea, game species vary. Small and mobile animals (saiga antelope, horses, red deer, wild boar) predominate over large-sized animals (megaceros, bovines) (Векилова, 1971, p. 124-125, Табл. 3).

By comparison, the Epigravettian sites of the middle Dniepr valley, where mammoth remains dominate in the faunal material, show a completely different proportion of the microliths in the tool kit, from 6 % to maximally 39 % (Nuzhnyi 2006, p. 58-93). The relative proportion of microliths decreases in the Epigravettian sites of the bison zone in southern Ukraine: from 7.4 % to maximally 41.8 % (Кротова, 2000; Главенчук, 2003-2204).

Thus, the high proportion of microliths in the inventory of Buran-Kaya 3, as well as in other Epigravettian and Aurignacian sites of Crimea could be related to (1) the high variability of the game and (2) the relatively small size and high mobility of these hunted animals. The hunting activities of the Epigravettian inhabitants in Buran-Kaya 3 required flexible strategies especially in the mountainous areas, different types of weapon, with an important use of bow, as demonstrated by the flint and bone arrow heads, and a high proportion of microliths per hunted animal.

The lithic inventories of the Epigravettian layers 5-2, 6-1 and 6-2 from Buran-Kaya 3 are analogous to Siuren 1 (layer 2) and Adzhy-Koba (layer 2) complexes. At all these sites, cores were used with one striking platform and narrow flaking surfaces and the same multiplatform cores with narrow flaking surfaces. The retouch of the microliths is exclusively low, semi-abrupt and abrupt; there are bilateral and convergent backed points. Simple end-scrapers and angle burins on flakes predominate, and *pièces esquillées* are present. According to the lithic inventories, these three sites represent one of the three local variants of the Epigravettian in Crimea (Яневич, 2000).

The perforated shell pendants from layers 5-2, 6-1 and 6-2 at Buran-Kaya 3 have two origins: fresh water (*Theodoxus* sp.) and the Black Sea (*Cyclope neritea* L., *Nassa* sp). These pendants were found in all three Epigravettian layers of Buran-Kaya 3 and may have had a high importance for the Epigravettian population of the site, as elements of personal ornament. During Epigravettian they were only spread in northern Ukraine and adjacent areas

of Russia, in the region of the middle Dniepr (Iakovleva, 2005; Nuzhnyi, 2006). It must be emphasized, that in the southern Ukraine, pendants made from perforated molluscs *Theodoxus* sp. and *Nassa* sp. shells were only found in two Epigravettian sites: Solone Osero IX, lower layer (Оленковский, 2000, с. 74, fig. 51: 28, 29) and Dubova Balka (Abramova, 1995, fig. 10: 2, 3). Both sites lie between the Crimea and the middle Dniepr region, in the Sivash Lowlands and the Dniepr rapids respectively. Thus, these sites, as well as Buran-Kaya 3, may mark a spreading path of the mollusc shells from the Black Sea area to northern Ukraine.

The other objects of mobile art from the Epigravettian layers of Buran-Kaya 3 have many analogies in the Upper Palaeolithic of northern Ukraine and Russia: especially the blades of mammoth ivory with "meander" ornament in Mizyn (Шовкопляс, 1965, с. 218, fig. 55), Barmaki (Nuzhnyi, 2006, p. 65, fig. 6: 14-17) and Kostenki 1 (Abramova, 1995, fig. 74: 6). Ivory teardrop-shaped and bilobate pendants are present in Molodova V, layer 8 (*ibid.*, fig. 9: 2), Mizyn (Шовкопляс, 1965, tabl. XLVI: 1-12), Gagarino (Abramova, 1995, fig. 52: 8), Kostenki 1 (*ibid.*, fig. 72: 2), Kostenki 4 (*ibid.*, fig. 87: 2) and Sungir (*ibid.*, fig. 50: 1-4, 6). In Buran-Kaya 3 no mammoth bone was found. The southern border of this animal area was about 450 km northwards from the site in the Epigravettian, at 49°N latitude. All artefacts made of mammoth ivory at Buran-Kaya 3 undoubtedly appear as imports. They were found in the same stratigraphic unit, the lower part of the layer 6-1. Therefore, these ivory ornaments may suggest contact with the human populations from the middle Dniepr or the Kostenki on the Don areas.

The analysis of the human remains, found in 2001 in the layers 5-2, 6-1 and 6-2 of Buran-Kaya 3, sheds light on the presence of a minimum of seven individuals (juvenile, sub-adult, adult and old adult). Some of them present a nutritional deficiency. The ongoing analysis of the taphonomic traces and spatial distribution of the human remains should give us more information about the nature of this deposit. The occurrence of numerous anthropological remains raises further issues about the function of the site.

Apart from Buran-Kaya 3, Upper Palaeolithic human remains are very rare in Ukraine. They are usually represented by isolated teeth, or skull fragments associated with isolated fragments of postcranial skeleton: fragments of the skull(s?) and a humerus of a young individual in Novgorod-Siverskij 1 (Підоплічко, 1947а, p. 93-94), a fragment of a skull in Chulativ 1 (Підоплічко, 1947б, p. 138, 139, 148, tabl. IV; Гремяцкий, 1947, p. 121-122) and a skull of a young woman at Anetivka 2 (Станко та ін., ред., 1997, с. 109-111). The skull fragments from both Novgorod-Siverskij 1 and Chulativ 1 bear cut marks. The skull from Anetivka 2 was found with ochre and represents, according to V.N. Stanko, a ritual burial. These finds may indicate the possible existence of burial practices involving the head of the deceased during Upper Palaeolithic in Ukraine.

## ACKNOWLEDGEMENTS

The analyses were supported by the ANR “Mammouths” Research Program No. ANR-05-JCJC-0240-01 (principal in-

vestigator: S. Péan, Museum National d’Histoire Naturelle, Paris) of the French National Research Agency (Agence Nationale de la Recherche). We would like to thank Benjamin Patenaude for his help in correcting the English text.

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**Резюме**

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**ВЕРХНЕПАЛЕОЛИТИЧЕСКИЕ ПОСЕЛЕНИЯ В БУРАН КАЕ 3 (КРЫМ, УКРАИНА): НОВЫЕ  
МЕЖДИСЦИПЛИНАРНЫЕ ИССЛЕДОВАНИЯ СЛОЁВ 5-2, 6-1 И 6-2**

Грот Буран Кая 3 (Крым, Украина) содержит уникальную стратиграфию литологических и культурных отложений, включающую индустрии среднего и верхнего палеолита. В частности, в слоях 5-2, 6-1, и 6-2 был обнаружен кремневый и костяной инвентарь, относящийся к эпиграветту. Эти же слои содержат многочисленные фаунистические остатки, а также антропологический материал. В данной статье публикуются некоторые результаты междисциплинарных исследований: технико-

типологический анализ кремневого и костяного инвентаря; зооархеологическое изучение останков крупных млекопитающих; исследование технологии нанесения орнамента на кости; анализ палеоантропологических материалов. На основании полученных данных предлагается функциональная интерпретация стоянки, а также производится сравнение культурных характеристик эпиграветта Буран Каи 3 и памятников соседних территорий.