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OSSEOUS RAW MATERIAL EXPLOITATION AND TYPOLOGICAL VARYABILITY AT MESOLITIC ALIBEG (THE IRON GATES REGION, ROMANIA)

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The Mesolithic settlements in the Iron Gates have yielded rich assemblages of antler, bone and Sus scrofa canines, exemplified here by the site of Alibeg (Romania). These raw materials represent for the Iron Gates region, a hallmark of local Mesolithic. The typological categories identified are bevelled tools, scrapers, preforms and blanks. Débitage remains are also present, indicating on-site raw material processing. All three categories of raw materials were readily available from the animals that were killed, and analysis of the faunal remains identified *Cervus elaphus* and *Sus scrofa* bones within the mammalian assemblage. Our study aimed to identify the transformation pattern of antler, bone and tusk and the functional marks that could offer clues to the way in which the pieces were used. Ethnographical studies suggest wood and hide processing as the main activities performed with such tools.

Keywords: archaeology, zoology, Mesolithic, Iron Gates, antler, bone, Sus scrofa tusk, functional analysis.

Introduction

In the Iron Gates section of the lower Danube valley, archaeological surveys ahead of dam construction in the 1960s and 1980s led to the discovery and subsequent excavation of over 50 open-air and cave sites, providing a record of Stone Age settlement from the Late Pleistocene to the middle of the Holocene.

Most of the sites were uncovered in salvage excavations undertaken between 1965-1971 and the early 1980s ahead of Iron Gates I and II hydro-electric power-stations construction. The excavations were conducted rapidly, with variable standards of recovery and recording, and poor chronological control. Published accounts of the excavations vary in quality and detail, and published photographs and/or accurate plans were limited. Recently, more attention was paid to the earlier collections of finds, since new excavations are impossible (all but two sites – Schela Cladovei and Vlasac) having been covered by the Danube waters.

The site at Alibeg was located on the left bank of the river, upstream of the confluence of the Alibeg River with the Danube, on a low area in the very proximity of the latter (fig. 1). Although identified in 1968, excavations did not take place until 1971, the position of the site further up in the area of the Gorges making it one of the last ones to be exposed to flooding. At the beginning of the excavations at the surface were visible faunal remains, lithics and a “simple” hearth in the shape of an area exhibiting heavy firing (V. Boroneanţ, pers. comm.).

Information regarding the site was presented in a series of earlier publications (Boroneanţ, 1973, 2000; Păunescu, 2000) that concentrated on general information: location of the site, stratigraphy (Mesolithic and possibly Early Neolithic), archaeological features, lithic industry, and briefly, considerations on the faunal remains and the osseous industry. A more detailed account of the excavation was presented in a recent publication (Boroneanţ, 2012). The latter focused mainly on the existing collection of Early Neolithic pottery and some faunal remains.

The excavations

Seven trenches were investigated during a rather brief period of time (a few weeks only) covering a total area of ca. 95.5 m^2 (fig. 2, 3).

The general stratigraphy of the site (Boroneanţ, 2000; Boroneanţ, 2012) indicates four layers of soil depositions (fig. 4): recent humus soil, eroded by water (archaeologically sterile); sandy yellow soil of probably alluvial origin (that contained scarce Early Neolithic sherds); compact black-brown soil (containing the Mesolithic occupation remains, with two distinct horizons, cf. Boroneanţ, 1973, 2000) and a brown-yellowish soil with calcareous concretions, archaeologically sterile. The excavation stopped before this layer was excavated completely, thus before the river bedrock was reached.

The identified archaeological features (two dwellings, three hearths and three agglomerations of lithic items – fig. 2) were attributed to the Final Mesolithic based on dwelling and hearth typologies (Boroneanţ, 2000; Boroneanţ, 2012). A possible Early Neolithic occupation of the site was also suggested based on the presence of the pottery sherds and a few lithic artefacts (Păunescu, 2000). It is equally possible that the presence of such sherds was the result of successive erosion and depositional processes during the 8200 cal BP event (Boroneanţ, 2012). Flooding episodes over this cooling period of ca. 300-400 years would also explain the abandonment of the houses, the rapid infill of the existing pit features and the heavy erosion observed on the pottery sherds at a moment when the presence of some of the elements of the Early Neolithic package were already present in the area (Bonsall, 2008; Borić, 2011; Boroneanţ, 2012).

The only existing radiocarbon date (Bln-1193) came from a charcoal sample from hearth V1 of dwelling C1 (fig. 2, 3) indicating an occupational episode around 7195±100 BP (6210 – 5988 cal BC (68.2 %) or 6336 – 5846 cal BC (95.4 %)) (Borić, 2011), and thus supporting the Final Mesolithic development of the site, proposed by the excavator.

The osseous assemblage

The information on the early prehistoric osseous industries for the Iron Gates sites is still poor, and initially restricted to Vlasac and Padina. An attempt to describe it was made by V. Boroneanţ (2000) for the sites on the left bank, but similarly to previous publications, the typology used relied mostly on the presumed functionality of the items (Srejović, Letica, 1978. P. 83–103; Bačkalov, 1979; Radovanović, 1996. P. 252–276; Boroneanţ, 2000. P. 119–124). More recent research focused on the morphology and use-wear traces of the active part of the artefacts (Vitezović, 2011 - for Kula, Mărgărit and Boroneanţ, 2017 – for Răzvrata, Mărgărit *et al*., 2017 – for Ostrovul Banului, Vitezović, 2017 – for the Early Neolithic of the area generally).

The first brief presentation of the Alibeg artefacts was in Boroneanţ (2000), and later in Boroneanţ (2012). The initial information (on the former publication) listed 46 items, 5 artefacts more than what the present-day collection holds. The missing five pieces might account for the identification of roe deer antler as raw material also, appearing in Boroneanţ (2000). The rest of the raw material comprised red deer antler, mammal bone and wild boar tusk. The initial publication presented the artefacts as one assemblage, although there were two identified Mesolithic horizons (Boroneanţ, 2000).

Bearing these in mind, and given the size of the collection, its homogeneity (see also below) and the lack of evidence at the present moment that would indicate two or several periods of occupation at the site (Boroneanţ, 2012), the osseous assemblage was treated here as a single entity.

Methodology

For the present study, the artefact types were identified following *Fiches typologiques de l'industrie osseuse préhistorique* (Camp-Fabrer (ed.), 1990, 1998), taking into consideration the morphology of the active front/working edge of the artefacts. It thus follows that the identified typological categories are very different from those in Boroneanţ (2000) and/or Păunescu (2000). The artefacts came from six trenches (all but SIV) both from the cultural Mesolithic layer and the two dwelling features identified. Neither the stratigraphy of the site, nor the position of the artefacts within the trenches suggest their affiliation to a cultural horizon other than the Mesolithic one.

Other than observe the typological categories of artefacts, the aim of the present study was to identify (when/if possible) the existing operational chains employed for the manufacturing of the various items, and also, to determine their functionality, having as a starting point their morphology and the presence/absence of observed use wear traces.

Macroscopic and microscopic examination of the technological and wear traces present on the archaeological artefacts was undertaken. The location and character of manufacturing marks and use-wear were systematically recorded. Microscopic examination and photography were undertaken with a Keyence VHX-600 digital microscope, at magnifications of ×30 to ×150. Our interpretations were based on recent studies of the manufacture and use of similar tools at prehistoric populations in Europe and elsewhere (e.g. Averbouh, 2000; Provenzano, 2001; Maigrot, 2003; van Gijn, 2007; Legrand and Sidéra, 2007).

Typology and morphology

1. Antler

The typology of the antler artefacts comprises six categories: bevelled tools (eight items), pointed tools (one item), preforms (one item), blanks (one item), débitage waste (one item) and indeterminates (five items).

1.1. Bevelled tools

Based on the type of blank (flat or on volume) and the morphology of the artefacts, four sub-categories were identified, one for the former type of blank and three for the latter (with the sub-categories "bevelled tools on antler base", "bevelled tools on beam" " bevelled tools on tine"). In two instances the blank type could not be determined.

Table 1. Distribution of the artefacts by types and raw materials.

Raw material	Type	Initial no. of artefacts (Boroneanț 2000)*	Present no. of artefacts (Mărgărit, Boroneanț)
Antler	Bevelled tool (chisel)	7	8
	Pointed tool	-	1
	Indeterminate	-	5
	Preform	-	1
	Blank	5	1
	Débitage waste	-	1
Total		**12**	**17**
Bone	Bevelled tool (chisel)	7	6
	Pointed tools	2	-
	Bead	?	-
	Indeterminate	1	-
	Preform	16	4
	Blank	-	3
Total		**26**	**13**
Tusk	*Racloir*	3	5
	Grattoir	1	-
	Poinçon	1	-
	Indeterminate	3	3
	Raw material	-	3
Total		**8**	**11**

*The types of artefacts identified by V. Boroneanț (2000) are different from the present ones, the excavator using categories such as *plantoir, serfouette, herminette*. Their typological re-assigment was done in the present publication by M. Mărgărit based on published illustration with aim of having a general comparison.

A first sub-category is represented by three massive artefacts made from the base of the main beam. The common element of these items is represented by the preservation of the basal diameter with no technological modifications, in order to ensure a better grasp of the item in the hand.

One item (fig. 5: a) was made from an antler detached from the skull by percussion. The segmentation plan was not shaped. The main beam was segmented also by percussion over half of the diameter of the beam, followed by detachment by bending. This resulted in an *en languette* fracture representing the active front. The latter was shaped following the contour of the fracture plan, thus acquiring a convex morphology, specific to the bevelled tools. Following use, the active front has changed from a convex contour to a linear one, indicative of a long use in percussion actions.

The other two items were manufactured on shed antler. In one case (fig. 5: b) the beam was segmented by percussion over a half of the diameter followed by detachment through bending. The same specific fracture resulted, but in this case a shorter one compared to the first item. At present, the active front extremity appears compacted/compressed, with visible fractures, indicating percussion as main use.

For the third item (fig. 5: c) a different segmentation technique was employed. One of the tines was segmented by sawing with an abrasive string around the entire circumference (fig. 5: d, e), followed by bending when the spongy tissue was reached. The beam was segmented also by sawing, applied this time on half of the diameter, followed by detachment by bending. Following this procedure, resulted a segmentation area with walls exhibiting concave morphology, smooth aspect and long fine striations, transversal to the axis of the artefacts. The rest of the technological data coincides with those of the previously described items (in what the use-wear on the active front was concerned).

A second sub-category of bevelled tools (fig. 6: a) also massive, was made on antler beam. The anatomic volume was preserved, with a segmentation procedure made by percussion. At the mesial level a perforation was made, initially started by percussion and continued by rotation. At the distal end, a bevelled active area was shaped. The complete morphology of the distal front could not be entirely determined given the advanced state of the use-wear, with heavy fractures and compaction. These suggest, similar to the previously described pieces, its use in percussion actions. This time, the shafting was done transversally, probably in a wooden handle.

A third sub-category is represented by a bevelled tool made on a tine (fig. 6: b) segmented from the branch by percussion, followed by bending. A small fracture specific to the latter technique is preserved. On the tip of the tool, a flat area was shaped apparently through longitudinal scraping (fig. 6: c), resulting in a concave morphology of the chisel type. The item has a degraded surface thus making the identification of the degree of use-wear difficult.

In one case a flat blank was employed (fig. 6: d), resulting a finished item. This was obtained by longitudinal bipartition of the antler through percussion. The shaping of the active front was made unifacially, from the inferior side, through scraping.

Two small fragments (fig. 6: e) – one heavily burnt – seem to come also from bevelled tools. Due to their fragmentation, the blank type could not be determined. Their typological affiliation was done based on a preserved shaped side, having an oblique morphology.

1.2. Pointed tools

The only artefact (fig. 7: a) in this category is similar from a technological point of view with the massive bevelled tools in the first sub-category. It was also made on the base of a shed antler, with the basal tine preserved and used as handle. The segmentation of the tine was made by percussion. The morphology of the active point is different from the one of the bevelled tools. In this case, the active front is pointed, with the form given by shaping along the fractured side. Nevertheless, this "point" was used in the same manner as the bevelled tools, for percussion actions, which resulted in a heavily compacted extremity.

1.3. Indeterminates

This category includes very fragmented items, where the manufacturing stage or the morphology could not be determined. However, the presence of certain morphological stigmata indicates that some degree of processing took place. One fragment – resulted probably from a beam (fig. 7: b) – was segmented with a string by sawing. A mesial beam fragment (fig. 7 :c) manufactured on a volume blank preserves the traces of segmentation of the tine by percussion along the entire circumference. It was impossible to determine the segmentation technique of the branch itself, given the presence of many fractures. Two beam fragments (fig. 7: d, e) preserve the traces of segmentation by percussion. The presence of both longitudinal and transversal fractures did not allow for more information. For the only present item made on tine in this category (fig. 7: f) segmentation was made by percussion around the entire circumference. The anatomic volume was preserved and it is possible that the spongy tissue was intentionally eliminated, suggesting a longitudinal type of hafting. It is also possible that the spongy tissue was destroyed by taphonomic processes. The tip of the tine was fractured recently.

1.4. Preforms

A *Cervus elaphus* tine (fig. 8: a) fractured at both extremities and extremely degraded preserved traces indicating that the item had reached the prerform stage. The volume of the tine was preserved. At the proximal end were identified stigmata corresponding to segmentation by percussion. On one of the sides, in the mesial area, several transversal cuts are indicative of an incipient perforation.

1.5. Blanks

A basal tine (fig. 8: b) was segmented by percussion around the entire circumference, with detachment by percussion also. It was recently fractured towards the tip. The size of the artefact would have allowed for its transformation in a finished tool but lacking any traces specific to the finishing stage it is likely that the tine was only a blank.

1.6. Débitage waste

The basal area of a shed *Cervus elaphus* antler (fig. 8: c) falls into this category. The small size would not have allowed for its transformation into a tool. The detachment from the branch was made by sawing with an abrasive string.

2. Bone

The identified bone artefacts fall into three categories: bevelled tools (6), preforms (4) and blanks (3).

All **bevelled items** were made on flat blanks, from the cortical part of the diaphysis of long bones. The longitudinal débitage involved bipartition or successive partitions by percussion. In the case of the first item (fig. 8: d), the débitage edges were not shaped. The active front was given a bevelled shape through unifacial abrasion on the inferior side. The proximal end of the artefact was shaped by bifacial abrasion. Unfortunately, following its discovery the item was covered with conservation varnish rendering the identification of use-wear traces impossible. The compaction and fractures at the proximal extremity indicates that it was an intermediary tool, such as a wedge.

The second artefact in the category (fig. 8: e) had a badly degraded surface and was transversally fractured. Similar to the first item, the sides were not shaped following the débitage. The active front was made through unifacial shaping of the distal end, on the inferior side.

The third item (fig. 8: f) was fractured both transversally and longitudinally. In this case the preserved side was shaped by abrasion. The active front was made by abrasion also, applied on the inferior face and exhibits no use-wear.

A distal fragment (fig. 8: g) preserved the traces of a different technique in the shaping of the distal end: longitudinal scraping applied on the interior face, at the distal end exclusively. The active front was affected by use-wear (fig. 8: j), with a median fracture extending on the superior face.

The fifth piece (fig. 8: h) is also fractured. One of the débitage sides was shaped by diffuse percussion. The active front was processed by bifacial abrasion of the distal end. On the mesial area appeared a small fracture caused probably by use.

The last item (fig. 8: i) is a meso-distal fragment, with a heavily degraded surface. The active front was shaped at the distal extremity on the inferior face. Small fragments broke from the active front, probably following contact with the worked material.

The **preforms** (four bone fragments – fig. 9: a-d – were made of the cortical part of the long bone diaphysis from large mammals. These are flat blanks obtained through longitudinal bipartition by percussion. During the next stage of the manufacturing process, one of the sides was shaped by diffuse percussion, thus transforming these blanks into preforms.

Blanks (fig. 9: e) are represented by three bone fragments, obtained through longitudinal bipartition by percussion.

3. Wild boar tusk

Five scrapers and three indeterminates were made of wild boar tusk.

All **scrapers** were made on flat blanks and were obtained through bipartition or successive partitions, all made longitudinally. An interesting morphology was noted on an item obtained from the upper part of a tusk (fig. 9: f). The débitage sides were left unshaped and technological traces were only noted on the distal area: a concave facet with traces of scraping. This continues with a side oblique to the axis of the item, also shaped by scraping.

The second item in the category (fig. 9: g) was made on a blank obtained through bipartition by percussion. At the distal end the item was fractured but certain scraping traces (fig. 9: k) could be observed on both sides, triggering a concave morphology. The remaining three items (fig. 9: h-j) were obtained from the main block of raw material by percussion. The inferior face was superficially shaped by abrasion. The concave side preserved the traces of longitudinal scraping.

The three **Indeterminates** exhibit various technological stigmata. Given their heavy fragmentation, their morphology, and implicitly the lack of indications on the manufacturing stages – they could not be determined. Two such fragments (fig. 10: a, b) were made on flat blanks resulted from longitudinal percussion. No shaping traces were observed. The third fragment (fig. 10: c) belongs to a flat blank made by longitudinal bipartition of the tooth, by percussion. One of the sides might have been shaped by diffuse percussion suggesting the item was a preform. No other stigmata was visible, the item showing fractures at both extremities.

Three *Sus* sp. canines were considered as “bulk raw material” (fig. 10: d). They are extremely important, allowing for a pertinent reconstruction of the operational chain of this type of raw material, from acquisition to discard. The three canines are not anatomically intact: their exterior part was detached from the mandible by percussion, without the root of the tooth. This technique would explain both the small size of the Alibeg items, and also the intensive exploitation of the tip part of the tooth. In other Mesolithic sites (such as Icoana) the proximal part of the tooth (closer to the root) was preferred, as it provided wider blanks.

Discussion

As stated by the excavator (Boroneanţ 2000) and also listed in Table 2[2] (Boroneanţ 2012), faunal remains from Alibeg are also few and poorly preserved.

Table 2. Mammal species identified for the Mesolithic habitation at Alibeg (adapted after Boroneanţ, 2012).

Taxa	Bone+ antler*	bone
Canis familiaris		2
***Bos* sp.**	5	5
Ovicaprine/Capreolus	4	4
Bos/Cervus	3	3
Bos primigenius	1	1
Cervus elaphus	52	14
Cervus/Capreolus	1	
Capreolus capreolus	2	
Sus scrofa attila		15
Total determined mammals	**85**	**44**
Total mammals	**114**	**73**

*Columns 2 and 3 indicate the number of the faunal remains with and without the antlers.

This situation may be explained by the small size of the excavated area and also by the hand-picking of the remains (as opposed to dry sieving or flotation employed at other sites such as Icoana and during the first seasons at Schela Cladovei). The best represented species (from this very limited sample) were deer and wild boar. What attracts attention is the relatively large number of antlers (38) compared to the number of deer bones (14), suggesting thus that shed deer antler was collected and brought to the site. The same thing is suggested by the presence of two unmodified *Capreolus* antlers, with no other skeletal material identified (Table 3).

Shed antler is more suitable for processing (Averbouh, 2000, 2005; Chech, 1974; Provenzano, 2001; Riedel *et al.*, 2004), given the fact that at maximum development, the surface of the areas with compact tissue (the ones used for manufacturing items) is larger. At *Cervus elaphus*, antlers reach their maximum development in September and are shed in February-March. It is reasonable thus to assume a seasonal period of antler acquisition towards the beginning of the spring.

It is very unlikely that the Final Mesolithic communities spent their winters in the close proximity of the Danube, along the lower beaches, where most of the identified sites were located. It is more reasonable to presume that they retreated on the upper terrace of the Danube or on the mountain plateaus, where they would have been less exposed to bad weather. The return to the Danube banks took probably place at the beginning of the spring, at a moment that coincided with gathering new stocks of antler.

The wild boar tusk was probably collected from the hunted animals, given both the presence of wild boar teeth among the faunal collection and of a mandible fragment (Table 3). Also, fresh tooth is better for tusk processing, old tusk becoming brittle in time.

The small number of osteological remains does not allow for further speculation.

Table 3. Distribution of faunal remains based on anatomical parts (adapted after Boroneanţ, 2012).

	Cornus	**Neurocranium**	**Dentes**	**Mandibula**	**Scapula**	**Radius**	**Pelvis**	**Femur**	**Talus**	**Metatarsus**	**Metapodalia**
Cervus elaphus	38	1			1	1	3	1		2	5
Capreolus	2										
Cervus/ Capreolus	1										
Sus scrofa			11	1			1		1		
Bos/Cervus						1		2			
Ovicaprine/ *Ca-preolus*			3								1

Raw materials used for manufacturing tools at Alibeg came from two sources: recycling food remains (in the case of bone, *Sus scrofa* tusk and less, deer antler) and collection (mostly deer antler). In the first case we deal with an opportunistic selection which did not involve any supplementary effort other than the hunting and preparation of the animal. In the second case, acquisition might have been specialized, the collection of the deer antler necessitating organized purposeful expeditions.

It is rare though the association on the same site of an important number of preforms and blanks with finished items, pointing both towards an on-site manufacturing, and stocking, that would have allowed for the immediate replacement of the broken items, thus suggesting a rigorous management of the raw materials. In the case of antler and tusk, the presence of such "stocks" was determined also by the seasonal availability or success in hunting.

The débitage indicates the existence of two types of blanks: flat and on volume. There is however a clear differentiation between the débitage of antler on one hand, and those of tusk and bone, on the other hand. In the case of antler (with one exception only), segmentation was exclusively transversal, with the preservation of the anatomic volume. In this case, the intention was to obtain blanks with a significant thickness, exploiting the major axis of the raw material. In the case of the only one flat antler blank, the transformation scheme involved bipartition.

The techniques used for débitage were percussion (11 cases) or sawing with an abrasive string (three cases), both associated with bending (especially when the shaping of the active front was desired).

Shaping of the débitage plan was probably employed in several cases but the technique itself (scraping) was securely identified only in two cases. In all the other instances the surface was heavily degraded and it was impossible to determine whether abrasion or scraping were employed. Volume modification was achieved through perforation, combining percussion and rotation.

In the case of tusk and bone, considering the identifiable traces, the detachment procedures were the following: 1. longitudinal débitage followed by bipartition; 2. successive partitions. In what the débitage techniques were concerned, only the use of percussion was observed.

Surface modification was achieved by diffuse percussion (with the shaping of the débitage sides), abrasion (for the shaping of the active front) and scraping (creating the active front, in one case only). For tusk was used diffuse percussion (in one case for the shaping of the débitage side), abrasion (in three cases for the shaping of the inferior face) and scraping (for the shaping of the active front and its periodic sharpening). No procedure of volume modification were observed.

The surface of the item appears degraded, thus no information on micro-stigmata (important indicators of the use-wear type) was available. But although partial, the types of fractures and the modifications observed on the initial shape of the active front yielded some functional information.

An interesting problem regards the use of the main typological category – the bevelled tools. Archaeological literature groups under this general category various types of tools, all having in common the creation of the active part by unifacial or bifacial shaping, thus obtaining the intersection of two convergent facets (Camps-Fabrer *et al.*, 1998). A generally convex active front, of variable width, is usually produced. Bone and antler bevelled tools belong to the category „transformation tools", generally used for processing hides (Christidou and Legrand, 2005; Maigrot, 2004; Raskova Zelinkova, 2010) or wood (Maigrot, 2004). On the Alibeg artefacts were identified compacted active fronts, with a general modification of the initial shape from convex to linear or concave. The proximal ends – when present – are also compacted, with longitudinal peripheral fractures. This might suggest tools used in wood processing, either as wedges (wood-splitting) or for removing bark.

A second interesting category of tools are the wild boar tusk scrapers. The very fresh aspect of the scraping suggests a periodic reshaping of the active front. This hypothesis was confirmed by ethnographic studies (Chiquet *et al.*, 1997) on Indonesian communities. These employed such tools for wood processing and tree bark, and the tools were often resharpened (Maigrot, 2001; Legrand and Sidéra, 2007; Sidéra, 2008).

Conclusions

The Alibeg assemblage comprises all products and sub-products resulted from a transformation scheme: finished items (20), preforms (5), blanks (4), débitage waste (1) and bulk raw material (3) (fig. 11). The typological and functional ranges of these items are extremely reduced. It is very likely that the number of artefacts at the site was much larger, the recovered sample being the result of taphonomic processes and handcollecting of the artefacts. It is conclusive though that the identified types were produced locally, at the site.

The present collection exhibits similar traits to other osseous Mesolithic assemblages in the Iron Gates. The existing information from Icoana, Ostrovul Corbului and Ostrovul Banului (Mărgărit *et al.,* 2017) and Kula (Vitezović, 2011) points towards the *in situ* processing of the raw materials, with the prevalence of transversal exploitation of antler and longitudinal exploitation in the case of bone and antler. Typologically, throughout the above mentioned assemblage was noted a significant presence of bevelled tools and scrapers.

Despite the small number of analysed items, the present study identified enough elements that offer significant information on the patterns of exploitations and management of certain raw material types. The osseous assemblage from Alibeg presents few variable characteristics, both typologically and technologically, suggesting the specialization of certain activities, such as wood processing.

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МЕЗОЛИТИЧЕСКАЯ КОСТЯНАЯ ИНДУСТРИЯ АЛИБЕГА (ЖЕЛЕЗНЫЕ ВОРОТА, РУМЫНИЯ)

А. Боронеант, М. Маргарит

Мезолитические стоянки, расположенные в районе Железных ворот, в том числе эталонная стоянка Алибег (Румыния), содержат значительные коллекции рогов, костей и клыков дикого кабана. На стоянке Алибег из этого сырья были изготовлены следующие категории изделий: орудия со скошенным концом, скребки и заготовки. На стоянке присутствуют остатки дебитажа, указывающие на обработку сырья на месте. Все виды сырья были получены в результате охоты на диких животных. Анализ фауны позволил идентифицировать в составе млекопитающих благородного оленя и дикого кабана. Исследование авторов было направлено на выявление способов обработки рога, кости, клыка, а также выяснение функций орудий и способов их использования. По этнографическим данным такие инструменты могли быть использованы в обработке дерева и шкур.

Ключевые слова: археология, зоология, мезолит, Железные ворота, рог, кость, клыки дикого кабана, функциональный анализ.

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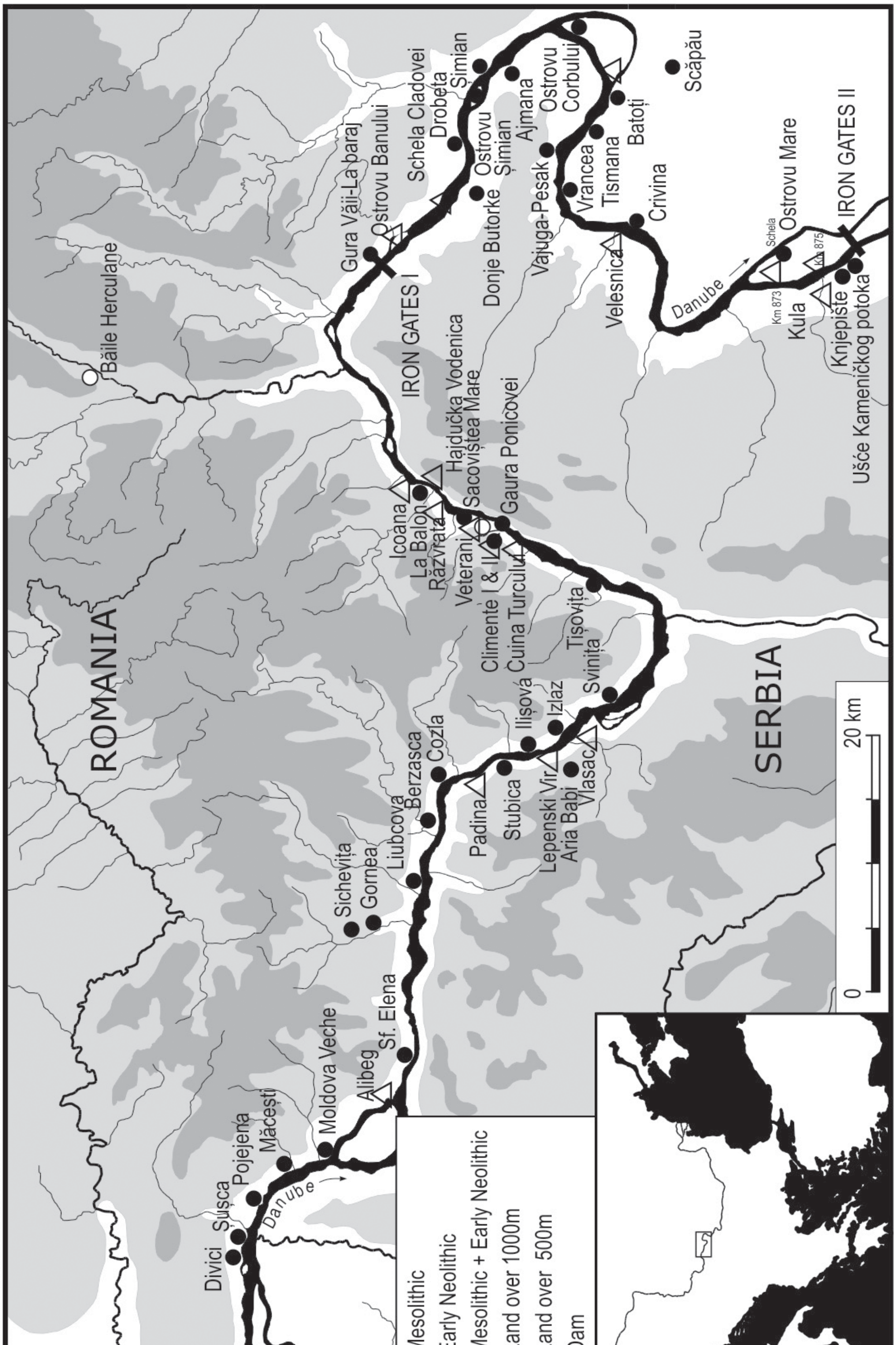

Fig. 1. Map of the early prehistoric sites in the Iron Gates.

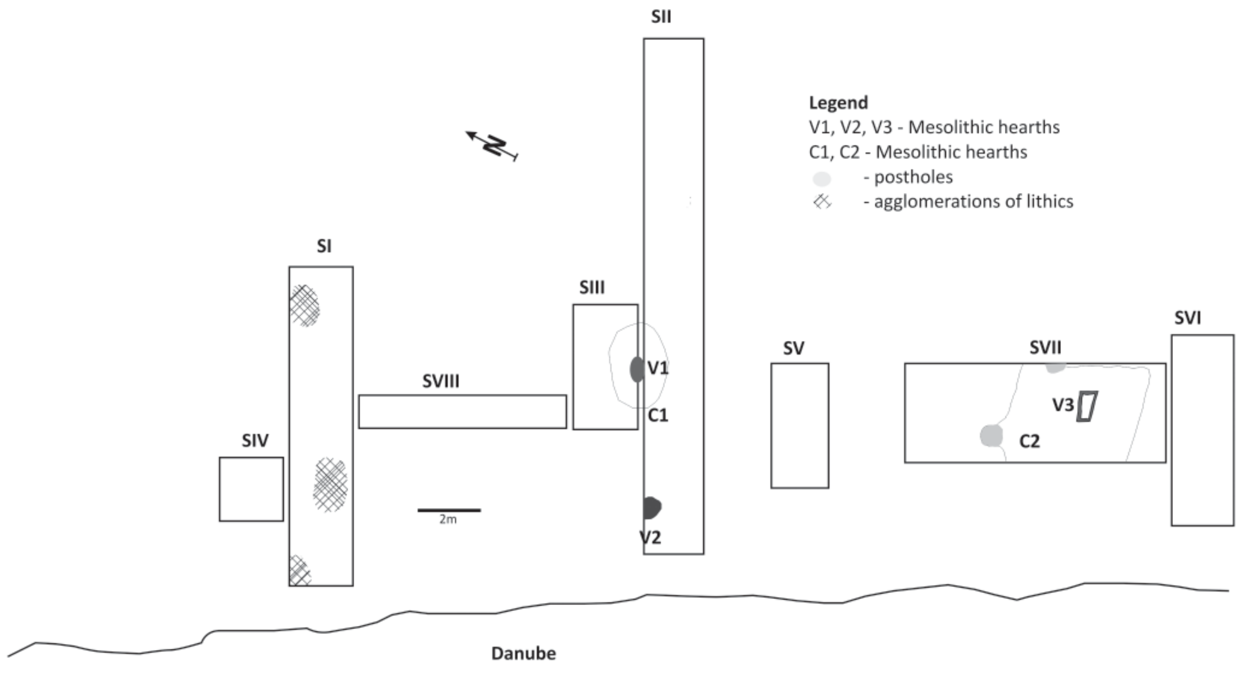

Fig. 2. Alibeg: location of the trenches and the Mesolithic features (adapted after Boroneanţ, 2012).

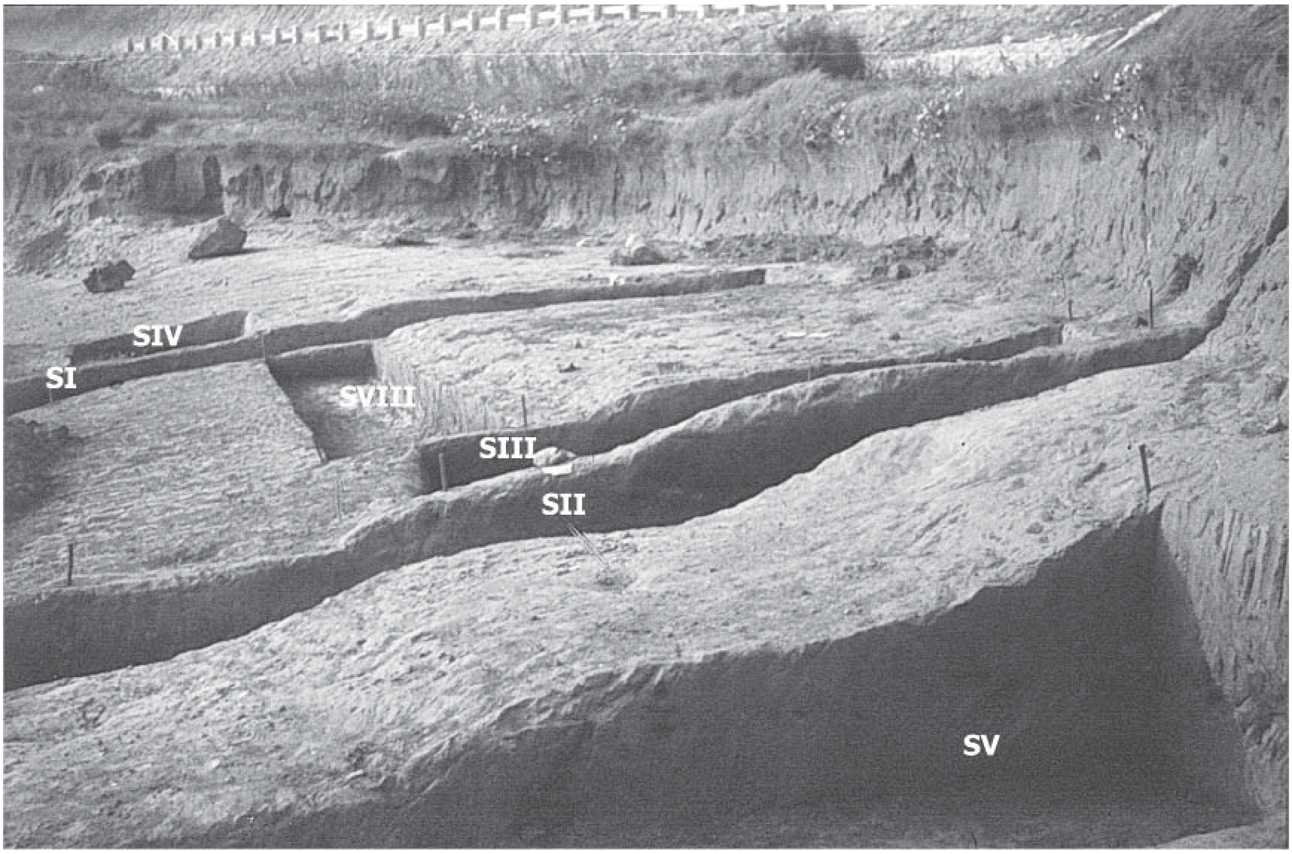

Fig. 3. Alibeg: general view of the trenches (photo V. Boroneanţ).

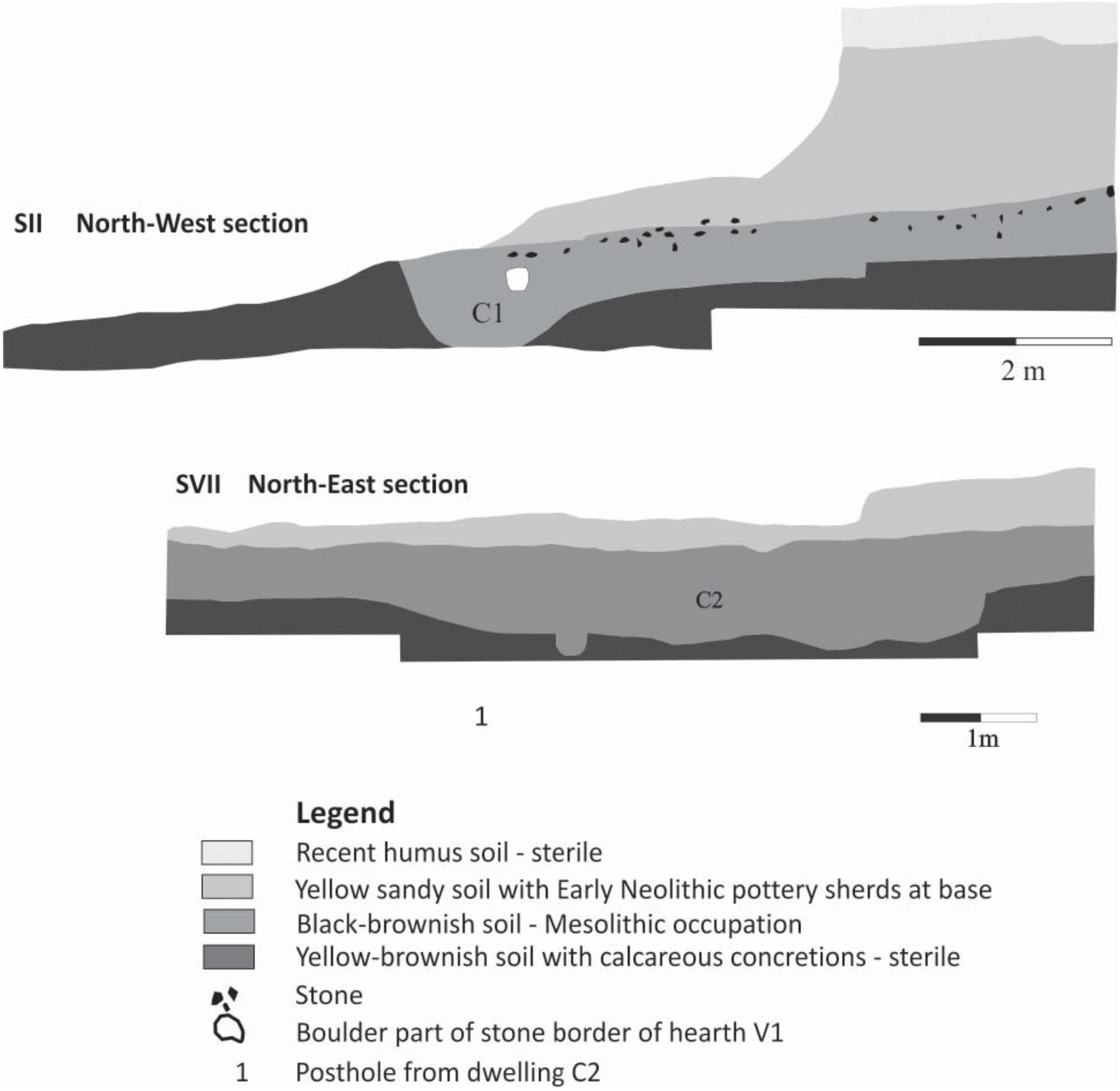

Fig. 4. Northwestern section of SII and north-eastern section of SVII (adapted after Boroneanţ, 2012).

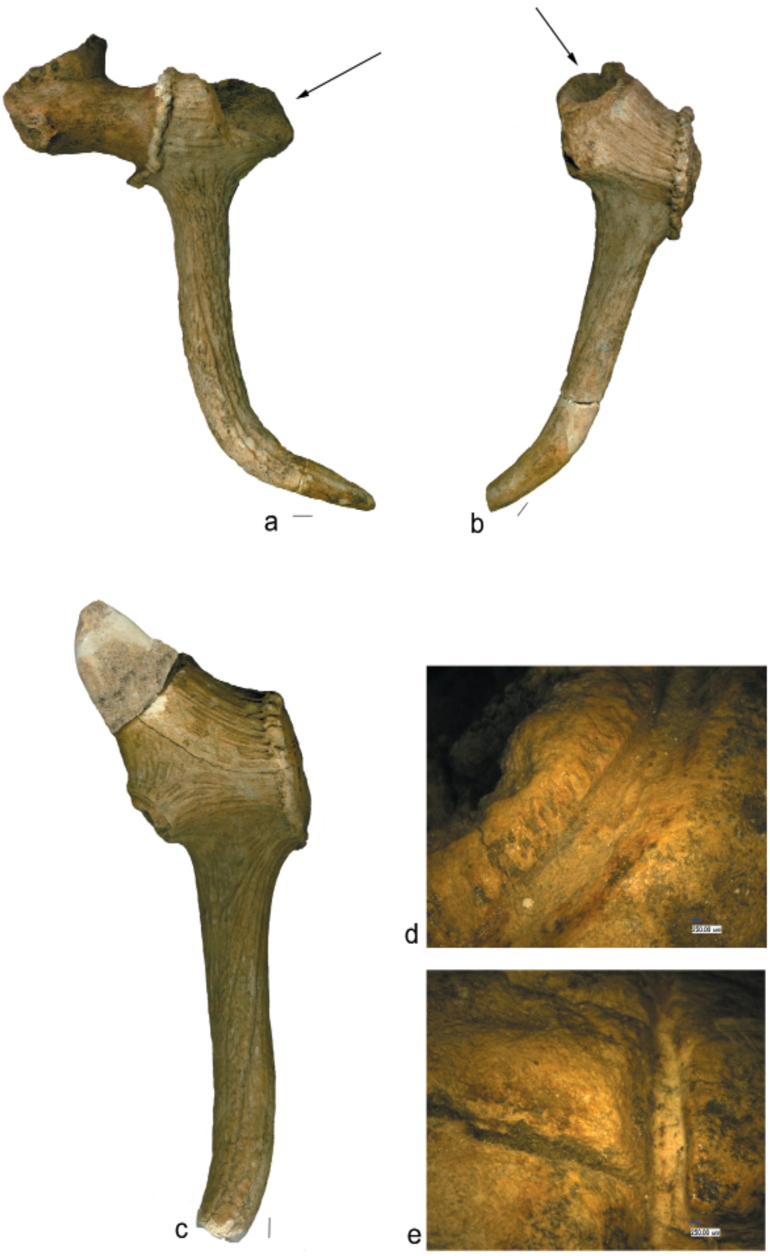

Fig. 5. Bevelled tools made on *Cervus elaphus* antler: a, b, c – massive pieces preserving the anatomic volume, made on the basal area of the beam; d, e – details of the segmentation plan obtained through sawing (×30).

Fig. 6 Bevelled tools: a – with the preservation of the volume of the beam; b – with the preservation of the volume of the tine; c – technological stigmata on the active front resulting from scraping (50x);
d – bevelled tool on a flat blank;
e-f – bevelled tool fragments.

Fig. 7. Antler artefacts: a – point; b-f – indeterminate pieces.

Fig. 8. Artefacts made of antler (a-c) and bone (d-i): a – preform; b – blank: c – débitage waste; g-i – bevelled tools; j – heavily used active front.

Fig. 9. Bone preforms (a-d); bone blank (e); boar tusk scraper (f-j) and use-wear stigmata resulted from scraping (×50) (k).

Fig. 10. Boar tusk indeterminate pieces (a-c) and raw material (d-f).

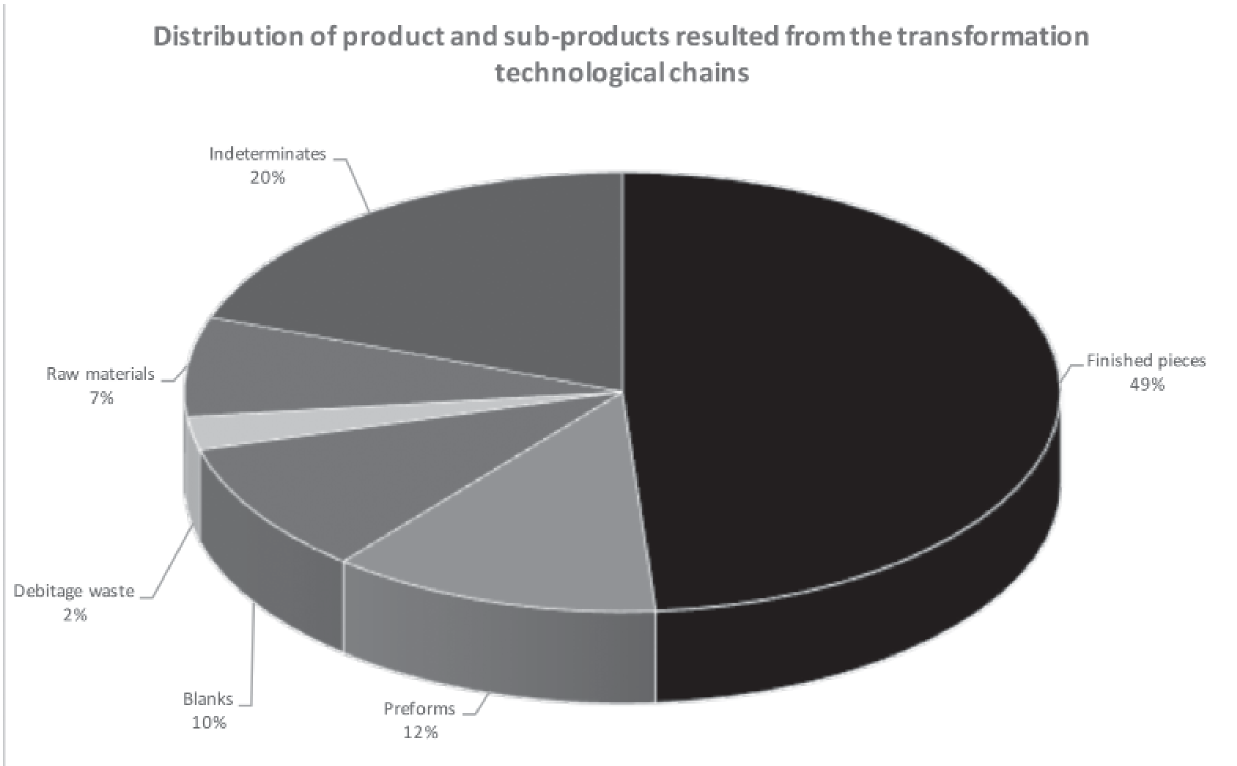

Fig. 11. Distribution of product and sub-products resulted from the transformation technological chains.

УДК 902.03 903.01

ПОЛУЧЕНИЕ ЗАГОТОВОК ДЛЯ ОРУДИЙ ИЗ КОСТИ И РОГА В МЕЗОЛИТЕ ВОЛГО-ОКСКОГО МЕЖДУРЕЧЬЯ[1]

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Результаты трасологических и экспериментальных исследований мезолитических материалов Восточной Европы свидетельствуют о применении при обработке кости и рога различных приемов для получения заготовок в зависимости от особенностей костного сырья и типа изготавливаемого орудия. Использование этих приемов и различных способов вторичной обработки позволяло изготавливать все необходимые на промысле и в хозяйстве костяные и роговые орудия. Одновременно с этим отчетливо прослеживается избирательность в использовании тех или иных костей различных животных. Главное предпочтение отдавалось рогам и костям лося – основного промыслового зверя в Волго-Окском междуречье на всем протяжении мезолита. Основные традиции и способы обработки кости и рога сложились в данном регионе, как и на большей части Восточной Европы, уже в раннем мезолите. В дальнейшем они развивались, появлялось новое сырье и новые подходы к использованию кости и рога, однако основа костяной индустрии сохранялась. Это в полной мере прослеживается не только при анализе законченных изделий, но и заготовок орудий из кости и рога и техники их обработки.

Ключевые слова: археология, мезолит, Волго-Окское междуречье, кость, рог, способы обработки, заготовки, орудия.

В мезолите лесной зоны Восточной Европы для изготовления орудий употреблялись далеко не все кости животных, добывавшихся на охоте. Отмечено преимущественное использование трубчатых костей конечностей крупных копытных, грифельных костей, лопаток, ребер, и рогов этих животных, главным образом, лося; локтевых костей медведя; трубчатых костей птиц и мелких зверей; а также зубов и челюстей различных животных. Другие кости или не использовались, или применялись в единичных случаях (Жилин, 2001).

Результаты трасологического анализа и проведенные эксперименты позволяют выявить основные приемы первичной обработки этих материалов. На этом этапе из кости или рога, имевших свою природную форму, получали первичную заготовку, или преформу, из которой при помощи вторичной обработки изготавливалось то или иное изделие. Выбор преформы и способов ее получения определялся формой и размерами законченного орудия. Как и при обработке камня, существовало несколько основных способов получения заготовок.

Первый способ применялся для изготовления, главным образом, крупных орудий, когда требовалось убрать с кости все лишнее: эпифизы, выступы и отростки и т.п. Для этого по границе участка кости, который было необходимо удалить, делался надруб или надрез (рис. 1: 3) или надпил по которому ненужная часть кости обламывалась, а если она была массивна – откалывалась каменным отбойником. Плоские кости обычно надрубались или надрезались с двух сторон, а для поперечного расчленения массивных костей округлого и близкого к нему сечения делался поперечный кольцевой надруб или надпил. Глубина надруба определялась расчленяемым материалом. Рог обычно надрубался до губчатой массы, а затем обламывался. Для этой операции, судя по следам на стенках компактной массы рога, применялись кремневые шлифованные или не шлифованные тесла, стамески или долотовидные орудия. Одно оббитое нешлифованное кремневое тесло,

[1] Исследование выполнено при поддержке совместного российско-французского гранта РГНФ (проект 14-21-17003/Fra) и Национального фонда научных исследований Франции (CNRS) «Особенности кости как одного из основных видов сырья и значение костяной индустрии в древних культурах Евразии» в рамках работы международной группы исследователей CNRS "Prehistoric exploitation of osseous materials in Europe" (GDRI PREHISTOS).