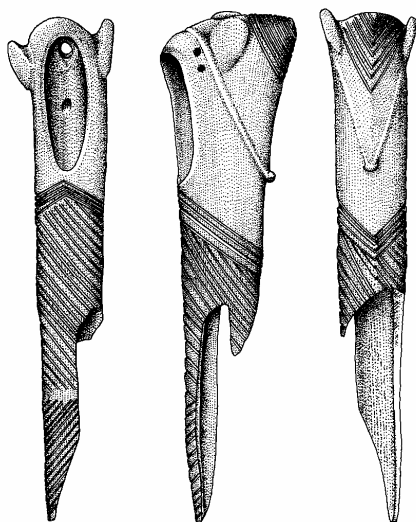


5th International Meeting of the ICAZ  
Worked Bone Research Group



ABSTRACTS

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Veliko Turnovo University



## THE UPPER PALEOLITHIC BONE AND ANTLER POINTS IN BULGARIA

**Aleta Guadelli**

Key words: projectile bone points, Upper Paleolithic, Transitional period, Kozarnika cave, Bulgaria.

One of the most significant objects of animal hard materials for the Upper Paleolithic is the points. Until now there was not enough data about this type of objects for our territory. The published points are not very numerous and a lot are with wrong chronological position and/or with bad interpretation (pseudo artifacts or unclear/incorrect typology). In the presented article we shall present the results of our PhD thesis connected with these types of projectile arms- technological and typological analyses. On the basis of that we want to correct the wrong presentation and interpretation in the existing schema including our territory especially for the Aurignacian culture and the Initial Upper Paleolithic (or Transitional period between Middle and Upper Paleolithic for some researchers). Also we are trying to give a possible interpretation of some assemblages and their relation with the similar ones in Western Europe and the Near East.

## SLIPPING BACKWARDS: BRONZE AGE SKATES AND RUNNERS IN THE CARPATHIAN BASIN

**Alice Choyke & Zora Zora Miklíková**

Horses, now so symbolic of strength and speed, began to appear in significant numbers in the Carpathian Basin with the coming of the Bell-beaker populations. Their bones appear to have been butchered and manipulated in exactly the same way as those of large ruminants such as wild and domestic

cattle. In keeping with this casual treatment, their bones are only used in opportunistic ways to produce Class II tools. The one exception to this was the use of the horse radii which were used to make what seem to be runners for some kind of sledge. The association between horse bone as raw material for tools used in hauling and ease of movement and horse as a source of power seems to have begun around this time in the Carpathian Basin.

The association continues into the Middle Bronze Age. However, at this time the connection becomes more personalized with the first evidence for skates. Evidence in Hungary is sparse with both cattle and horse bone being used. However, it appears that there was a strong tradition for skating further to the northeast in modern day Slovakia. It may be that this tradition comes from even further to the east, from the steppes region of the Ukraine.

By the Late Bronze Age it appears that horse bones are used exclusively for skates and this tradition continues here and there, for example, among groups like the Samaritans, contemporary with Late Antique Romans but living outside the Empire. Logically, evidence for skates and runners is being pushed back in time and, it seems, the trail points eastwards. This paper will explore that trail and the cognitive connection between horse use and this new mode of human transport

## A NEW METHODOLOGICAL APPROACH OF BONE SMOOTHERS AND AWLS: TRACEOLOGICAL STUDY OF AN EXPERIMENTAL CORPUS

**Aliette Lompre**

Within a doctoral research framework on the domestic bone tools (particularly smoothers, needles and awls) from the late Upper Paleolithic (Solutrean to Magdalenian), we have had

to work out an experimental approach on soft materials working process to set up a comparative traceological corpus.

At first, according to the assumptions most currently accepted by the scientific community, we concentrated on skin and leatherwork: we worked on dry, fresh and humidified hides. Nevertheless, in an attempt to broaden our approach and according to ethnological examples (Aïnou, Aleut, Lapon and north-eastern Siberian people), we also decided to use these tools on plant, especially bark (birch at first), keeping in mind the varieties available in Upper Paleolithic times.

To identify the activities and not just the worked materials, we decided to resort to the micro-topographical observation of use-wear (using MEB and micro-topographical station) to complete the data of low approach, and appreciate the advantages and limits of each method.

The present results on smoothers are only part of the experimental base of our study, which still has to be extended to awls and needles. These results have yet to be correlated with the analysis of archaeological artifacts and their use-wear, in order to characterize and identify the domestic activities that the bone tools were used for.

This multiscale approach has not yet been applied to Paleolithic bone industry and we hope that this field of investigation will spread with further research.

## A BONE FIGURINE WORKSHOP AT HOTNIÇA (ENEOLITHIC, BULGARIA)

**Aline Averbouh**

Technological analysis of the lithic industry of Eneolithic groups in the Balkans has revealed the presence of two production systems – one a domestic occupation and the other an eminently social and largely funerary occupation (Manola-

kakis 1994). At the crossroads of technical, social and cultural systems, it gives new vision of the emergence of hierarchical societies. A similar technological approach has been conducted on bone industries under the auspices of joint French-Bulgarian Program "Large blade workshop (L.Manolakakis et I.S. Ivanov directors 1995-2000), with identification and reconstruction of funerary production systems specific to those materials as its principle objective (Manolakakis et Averbouh 2004).

Figurines constitute the principal funerary goods made of bone (Todorova 1978, Ivanov 1989). In order to discern the economic and even social components of the funerary production, it was necessary to undertake the analysis of the domestic production system of these figurines from the habitation units. Thanks to the Foundation Fyssen and the authorization of the Bulgarian Academy of Sciences and the director of the Veliko-Turnovo Museum, we were able to study this singular figurine workshop at the tell of Hotniça (Angelov 1961) with this perspective. The results of our study will be presented at this colloquium.

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## CONTACT PERIOD CHANGES IN OSSEOUS TECHNOLOGIES IN ALASKA'S KODIAK ARCHIPELAGO

**Amy Vlassia Margaris**

Many arctic and subarctic foragers have traditionally relied on bone, antler, and ivory as raw materials for creating a wide variety of subsistence equipment. Archaeologists have paid scant attention, however, to which of these materials were preferred for what tasks, and why. Raw material availability, social factors, and the intrinsic properties of the raw materials can all influence a worker's choices. Young's Modulus, a measure of the stiffness of a material, was compared for compact bone samples from various species of land and sea mammals, as well as from caribou antler. Results thus far show that caribou antler is up to 4 times more flexible than the other types of tissues. All else being equal, materials which are somewhat flexible may be technologically best suited for high-impact uses, such as spear tips, because they are less likely to break upon impact.

Patterns of actual raw material use were also investigated through an analysis of artifacts from two late prehistoric archaeological sites in southern Alaska. Native Koniag groups in this region worked with a variety of osseous materials, especially sea mammal bone and caribou antler. Although antler was not locally available, it was the material of choice for such tool components as fishing harpoons and hook barbs, which were used to spear large fish along rocky creek bottoms, and which were highly curated. One technological strategy of the Koniag, then, was to choose raw materials for their ability to sustain frequent impacts and thereby increase a tool's use-life.

## BEYOND HOUSEHOLD ACTIVITIES: WORKED BONES FROM RAMESSID QANTIR, EGYPT

**Chiori Kitagawa**

This paper presents the preliminary results of the study of worked bones and shells from Qantir, the capital of Egypt during the Ramessid period. The site, whose area covers more than 10 square kilometers, is situated about 100 km northeast of Cairo in the eastern Nile Delta. The strata cover a time period of more than four hundred years of settlement, from about the 16th century to the beginning of the 10th century BC, i.e. from the early 18th to the 21st dynasty. Four main areas labeled QI, QIV, QV and QVII respectively have been excavated since 1980. So far about 14000 bone fragments and shells have been recovered during excavations.

About 350 pieces of worked bone could be recognized in the archaeozoological samples. The large majority comes from domestic mammals, in particular cattle and equids. Besides 65 worked shells have been identified. The horizontal and vertical distribution of the worked specimens in the different excavation areas will be discussed, together with the tools for their manufacturing occurring in the same strata. This study provides insight into the utilization of animal bones and shells, the technology of bone working and the activities associated with the production of these artefacts.



# PERFORATED TEETH AND IMITATIONS IN THE ENEOLITHIC OF ROMANIA: THE DEPOSITS

**Corneliu Beldiman, Diana-Maria Sztancs**

**Key words:** bone industry, Eneolithic, perforated teeth, prehistoric adornment, prehistoric technology, Prehistory of Romania, red deer canines.

One of the most spectacular category of discoveries related to the Eneolithic cultural complex Ariusd-Cucuteni-Tripolie spread in Romania, Republic of Moldavia and Ukraine are the accumulations including prestige goods as weapons (axes, dagger) and ornaments (bracelets, plates, rings, beads) worked in divers raw materials (stone, copper, gold, bone, shell, teeth, plant grains). Six from seven such deposits includes a variable number of beads made from perforated teeth and their imitations that often dominate the total number of pieces (see the table).

Site	Type of beads			
	Red-deer canines	Imitations on bone	Human molar	3
Ariusd	?	?	-	?
Brad	118	65	–	183
Carbuna	112	12	1	125
Chetrosica	?	90	–	90
Habasesti	20	2	–	22
Horodnita	–	–	–	–
Izvoare	–	13	–	13
Total	250	182	1	433

The paper is a first detailed synthesis based on systematic analyze of 432 perforated artifacts (conventionally designed as beads) on red deer (*Cervus elaphus*) canines and imitations (made on small fragments of long animal bones). The single

exception is a human molar present in the deposit from Carbuna, Republic of Moldavia.

Direct access to the study of some deposits coming especially from Romania (Brad, Habasesti, Izvoare) allow a comparative analysis of divers dimensional and technological characteristics. The common parameters systematically studied are the morphology of the perforations localized on the apical surface and the traces preserved inside or around the holes. The most part of the objects have a single perforation; several have two functional perforations and others were repaired after the damage of initial perforation during manufacture or use. On this basis some hypotheses of reconstruction of the «chaîne opératoire» of the perforation as well as some hypotheses of utilization are proposed.

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## PREHISTORIC ORNAMENTS IN OSSEOUS MATERIALS FROM ROMANIA: BRACELETS (EARLY NEOLITHIC)

**Corneliu Beldiman, Diana-Maria Sztancs**

**Key words:** bone and antler industry, bracelet, Early Neolithic, Prehistory of Romania, prehistoric ornaments, prehistoric technology, Starčevo-Cris Culture, Vinča Culture.

In the context of systematic approach of various set of prehistoric ornaments discovered in Romania, the paper presents the results of analysis of a special and relatively rare artifacts: the oldest bracelets ever known in this part of South-East Europe. The available repertory of 13 pieces has been discovered during the excavations made in 7 sites belonging to oldest Neolithic cultures in the country – see the table.

The bracelets are worked in several organic raw materials as bone (2), antler (8), and marine shell (*Spondylus gaedropus* L.) (3). The study proposes a typology; offer the correct identification of raw materials in every specific case, as well as the hypothetic reconstruction of the «schéma opératoire» of manufacture. The techniques include as main operations chiseling/chopping, transverse cutting, abrasion, scraping, and perforation.

Culture	Site	Raw material			Total
		Bone	Antler	Shell	
<b>Gura Baciului-Carcea I / Ocna Sibiului I Culture</b>	Carcea – “Hanuri”		2		2
	Cluj-Napoca – Gura Baciului			1	1
	Gradinile		1		1
<b>Starčevo-Cris Culture</b>	Drobeta-Tr.Severin – Schela Cladovei	1	2	1	4
	Trestiana		2		2
	Cerisor – “Cauce Cave”			1	1
<b>Vinča Culture, Phase A</b>	Gornea – “Caunita de Sus”	1	1		2
<b>3</b>	<b>7</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>13</b>

Of particular interest is a unique fragmentary object discovered at Carcea – “Hanuri”, worked in the basal part of a red deer (*Cervus elaphus*) antler and interpreted as terminal part of an open type bracelet. This find is still the earliest zoomorphic (ronde bosse) representation in organic raw material of the prehistoric portable art in Romania.

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## CRAFTING AND COPYING: ROMAN BONE CARVING AND THE MINOR ARTS

**Dávid Bartus**

While examining the roman bone objects, it can be noticed that all types of the carvings are in exact analogy with objects manufactured from different materials: bronze, gold, silver, jet, amber or wood. Hairpins, distaffs, knife handles, spoons, scabbard slides and numerous other objects exist under the form of the bone carvings, even generally in the same size. These objects show uniformity in the provinces of the Roman Empire from Hispania to the Near East, from Britannia to North Africa. To make a comprehensive and precise typology and chronology of the bone carvings, we have to pay attention to these objects, which made of different materials using different techniques, but for the same purpose. We should not analyze the bone carvings alone, but as a part of the roman minor arts.

However, this raise some problems and questions: Whether the cheaper, simply acquirable bone carvings are the copies of the more expensive objects? Can we observe the artistic activity just between the valuable objects? Or is it possible that

in some cases, the unmultipliable, individually workable bone carvings are the real records of the roman minor arts, contrary to the mass-castable metal objects? Is it possible that the Romans cast bronze objects using bone carvings pressed into clay moulds, copying their forms and motives? It can be presumed according some evidence that in some cases the bone is not a copying material, but the antitype of objects manufactured from other materials.

This lecture treats of the role of the bone carvings in the Roman artistic world, while trying to answer the above-mentioned questions.

#### BONE AND ANTLER ARTIFACTS OF THE COTOFENI CULTURE, LATE ENEOLITHIC: RECENT DISCOVERIES FROM TRANSYLVANIA, ROMANIA

**Diana-Maria Sztancs, Corneliu Beldiman, Sabin Adrian Luca, Marius-Mihai Ciuta**

Key words: bone and antler industry, tools, weapons, Late Eneolithic, Prehistory of Romania, prehistoric technology, Cotofeni Culture.

The paper presents the first results of analysis of 50 artifacts (tools and weapons) on skeletal materials belonging to the Cotofeni culture (Late Eneolithic). They are coming from recent excavations (1997 – 2004) carried out in two important sites located in southern regions of Transylvania, Romania: Cerisor – “Cauce Cave”, Hunedoara District (9 pieces); and Seusa – “Gorgan”, Alba District, open-air site (41 pieces). The approach offers the occasion to testing the paleotechnologic expressivity and data potential of the bone and antler artifacts of the Cotofeni culture. These aspects were never studied in such a perspective (typology, manufacture and use).

The repertory includes several types (various bone and antler points, bone arrow heads), as well as unfinished artifacts, raw materials, and waste. Among the raw materials we have antlers procured from red deer and roe deer; long and plate bones from domestic and hunted mammals (ovicaprine, cattle, wild boar). Special attention is paid to the aspects involved by the technology of manufacture in order to reconstruct eventually specific phases and to define the parameters of standardized production. The first stage of manufacture (debitage) includes elementary operations as fracture, splitting, chiseling/chopping, and grooving. The final shape (*façonnage*) was realized by abrasion, scraping, chiseling/chopping, grooving and perforation. All features are common to the domestic production of tools. The traces of use suggest practice of some domestic activities as wood and skin processing, chipping of flint.

Comparative analysis of artifacts allow also to establish some specific differences between economic activities from the open-air and cave sites; so, in Cerisor – “Cauce Cave” site one of current activities is related to stone tools production. Study of the specific parameters of technological behavior shows low rate of expressivity for the bone and antler industry of the Cotofeni culture due to the application of unsophisticated solutions.

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## PREHISTORIC ORNAMENTS IN OSSEOUS MATERIALS FROM ROMANIA: PENDANTS, DISKS AND PERFORATED TEETH (COTOFENI CULTURE, LATE ENEOLITHIC)

**Diana-Maria Sztancs, Corneliu Beldiman**

**Key words:** bone and antler industry, ornaments, Late Eneolithic, Prehistory of Romania, prehistoric technology, Cotofeni Culture.

Ornaments of the Cotofeni culture (Late Eneolithic) were never studied in a systematic manner. The paper propose first such attempt based on systematic analyze of 11 artifacts recently discovered in three sites located in southern regions of Transylvania, Romania: Cerisor – “Cauce Cave”, Hunedoara District; Ohaba-Ponor – “Bordu Mare Cave”, Hunedoara District and Seusa – “Gorgan”, Alba District.

The categories of typology include: pendant from red deer antler; perforated teeth (from dog and wild boar) and fossil shell, disk made from shell; shell collected as raw material or abandoned in first stage of transformation (see the table).

All aspects available of morphology and technology are analyzed in order to fix some specific characteristic having cultural relevance. If perforated teeth are quite common pieces in



the area of Cotofeni culture, others are rare or even unique artifacts as: the fossil shell (*Conus fuscocingulatus*) discovered at Cerisor – “Cauce Cave”: disk from *Unio* sp. shell and shell showing traces of debitage by indirect percussion coming from Seusa – “Gorgan” site. Some hypotheses of reconstruction of the «chaîne opératoire» of the manufacture as well as some aspects of utilization are proposed.

Type of ornament	Site			Total
	Cerisor – “Cauce Cave”	Ohaba-Ponor – “Bordu Mare Cave”	Seusa – “Gorgan”	
<b>Pendants</b>		1	2	<b>3</b>
<b>Perforated teeth</b>	2		2	<b>4</b>
<b>Perforated shell</b>	1			<b>1</b>
<b>Perforated disk (shell)</b>			1	<b>1</b>
<b>Raw material (shell)</b>			2	<b>2</b>
<b>5</b>	<b>3</b>	<b>1</b>	<b>7</b>	<b>11</b>

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## WORKED BONE FROM DÚN AILINNE, AN IRON AGE “ROYAL” SITE IN IRELAND

**Douglas V. Campana and Pam J. Crabtree**

Dún Ailinne is an Irish Iron Age ceremonial site located southwest of Dublin, near the modern town of Naas. Dún Ailinne has traditionally been associated with the kings of Leinster. Large-scale excavations were carried out at Dún Ailinne between 1968 and 1975 under the Direction of Professor Bernard Wailes of the University of Pennsylvania. They revealed a series of large circular structures surrounded by an inverted bank and ditch. These excavations also produced a large faunal assemblage (more than 18,500 animal bones and fragments) and a smaller collection of worked bone artifacts. The worked bone collection includes both finished objects and debris from bone-working. This presentation will examine traces of manufacture and wear on the Dún Ailinne bone objects. These traces provide evidence for a range of craft activities at this Iron Age site including bone working, textile production, and basketry or mat-making.

## BONE ARTEFACTS FROM THE MULTI-PERIOD SETTLEMENT OF BALATONŐSZÖD–TEMETŐI-DÜLŐ IN HUNGARY (MOTORWAY EXCAVATION M7/S10)

**Erika Gál**

The recently excavated settlement of Balatonőszöd–Temetői dűlő, located on the southern shore of Lake Balaton in Western Hungary yielded 103 artefacts made from mammalian skeletal parts. The majority of the material (96 objects) were excavated from Baden culture features, while the rest artefacts originate from the Celtic (one piece), Avar (4 pieces) and Árpád Period (2 pieces) contexts.

Both mundane and special implements were made from the antlers of Cervidae, pig tusks as well as different bone types of cattle (and probably aurochs) and small ruminants. First class tools include antler hammers, pig tusk blades and pendants, astragali of Caprinae as well as needle-like utensils and double points. Most of the artefacts are points and chisels made from the long bones of large and small ruminants. In addition to the radius, ulna and metapodia, the tibia of Caprinae were especially preferred when preparing bone points.

The abundant Baden culture artefact assemblage is so far the richest material known from the Copper Age in Hungary. The inhabitants of the settlement of Balatonőszöd–Temetői-dűlő skillfully utilized a great diversity of osseous materials as reflected by the variety of skeletal parts used and the broad range of the artefacts themselves. Surprisingly most of the tools seem to have been used for a short time only before abandoned. At the present stage of our knowledge of the settlement, this observation would indicate that it was only periodically inhabited and the tools were not carried on by people but discarded.

## ANTLER WORKING IN THE ROMAN MUNICIPIUM IUVAVUM (SALZBURG)

**Felix Lang**

This paper is coping with the processing of antler in Iuvavum, the Roman Salzburg. The first settling in the area of today's city is documented in the Augustean time and population has continued to rise with a climax in the 2nd C. AD into the Early Middle Age. The collection of Roman bone and antler objects, stored in the deposit of the local museum of Salzburg, which undertook most of the excavations in the town, shows an amazingly high amount of antler-waste

belonging mostly to the second half of the 1st and the 2nd C. AD. Even taking into consideration that just a small part of the whole area of the town has been excavated, some of the examples of bone-waste were not recognized by the excavators and until now there has been no archaeozoological examination of at least one of the Roman deposits, this contrasts clearly the preference of bone, known from other Roman sites. Most of the antler-waste was found in four find-spots, connected also with metal-processing. It seems that the dominance of antler, easily available from the mountain region, did not emerge through a preference of the material, but through the production of certain products, especially handles, for which antler was more suitable than bone.

## **BONE TOOLS FROM THE NEOLITHIC SETTLEMENT TĚŠETICE- KYJOVICE (CZECH REPUBLIC - MORAVIAN PAINTED POTTERY CULTURE)**

**Gabriela Dreslerová**

Neolithic Settlement of Moravian painted pottery culture in Těšetice – Kyjovice provided a large number of types of bone tools. This research studied about 300 bone and antler tools, together with semi-manufactured products and production waste.

We studied the whole collection of bone tools from this settlement. However, for purpose of this simple presentation, we chose only bone artefacts, excluding jewellery. Therefore we would like to present an overview of the general tools and focus more on some tools with unknown function.

The majority of the finds were identified as pointed tools (128 pieces). We divided these tools in several categories, according to the way they were worked and the chosen material from which they were made. Typical representatives would be

awls made from metapodium of small ruminants. There also occurred pointed tools without any preserved articular faces (?!).

There were also discovered interesting tools with two points (9 pieces). In several cases, their working is very different and points to different usage. What these tools have in common is a very sophisticated way they were manufactured in. They were also made from shafts of long bones of large animals. Distinguishing features for these tools are short ends, one of which is sharp and the other blunt.

In 4 cases we encountered bone tools with trapezoid cross-section of the point. None of them were preserved completely, but all of them had the same triangular shape and reached the size of 5 cm. due to both their shape and the way they were worked, we can presume that they shared the same function, such as that of an arrow head. There is another typologically different kind of arrow which was found on the surface of sites of linear pottery culture.

The next numerous group encompasses tools with transverse working border. Typical representatives are chisels of various sizes, made from midsized and large animals. A noticeable piece is a bone axe with perfect working that has roots in the Stone Age.

In MMK settlement we quite often encounter one bone tool type which could have been used as a button pin. A plate or a stick is made from shaft of a long bone and on one side it is worked through and a pin is stuffed there, using a clearing bone. One find from Těšetice – Kyjovice has the shape of a leaf with a pin on one side. This tool could have been used for working long bones, metacarpus or metatarsus of cattle or deer; in one case it was used to work a radius of a horse. These tools were probably accompanied by polished stone tools.

Another group of bone tools are those made from canines of pigs or wild boars, with a very sharp edge rising from

longitudinal break which is very appropriate for cutting. In addition to these knives we encounter bone tools with marks of working that are parallel to the length of a bone tool. Therefore we can suppose that these tools served as knives too.

Since the osteological artefacts from TK were preserved in a very good condition and because almost one third of organic tools were discovered by archaeozoological diagnosis, this collection can be useful for comparison with other settlements of this culture.

## WHAT WERE THEY MADE FOR? NEW FINDS OF BONE TOOLS FROM A MIDDLE NEOLITHIC SLOVAKIAN SITE **Gertrúda Bržinová – Zora Miklíková**

Enigmatic objects found during salvage excavations at the Middle Neolithic site of Veľký Šárad in Hurbanovo-Bohatá (district of Komárno, SW Slovakia) are presented in this poster. They were uncovered in situ in a pit in the settlement in the same position as they were left by the ancient inhabitants. The significance of four cattle ribs carefully worked into double pointed spatulae remain a mystery for the excavator.

The poster shows the situation in which this group of worked ribs was discovered and offers suggestions for some of their possible functions. Besides this unusual find, the rest of the bone industry is briefly presented. The first evaluation of the excavated material it was possible to date the tools to the Želiezovce Culture. Settlements of this archaeological culture were distributed around southwest Slovakia, northern Hungary and Lower Austria.

# ON THE ORIENTATION AND DISTRIBUTION OF SCRATCH MARKS AND SURFACE WEAR ON PUTATIVE JAW-BONE SLEDGES.

**Günther Karl Kunst & Mathias Mehofer**

At the meeting of the WBRG in Tallinn 2003, worked cattle mandibles with polished and abraded lower margins from Late Iron Age and Roman contexts were presented. An interpretation as sledge runners was suggested (Stopp & Kunst in print). The present paper takes a closer look at the use wear of some of the mandibles from Mautern (Lower Austria) using a stereomicroscope with low magnification for an overall survey and SEM-photographs for selected bone areas. The specimens chosen for study exhibit marked differences in the amount of bone area affected by the alterations. As the mandibles are from the same archaeological background, these differences are easily explained as progressive stages of the same abrasive process. Generally, the abraded surfaces of the mandibular bases are covered with fine scratch marks showing a marked preferred orientation, mostly running obliquely at an angle of about 10-20° to the main axis of the bones. This orientation is in accordance with the assumption of the jawbones having been used as anatomical pairs. This arrangement of the sledge runners is also indicated by a gradient in the density of the striations between the lateral (labial) and medial (lingual) sides of the mandibular corpora. Individual marks can best be traced during initial stages of use or in surface areas which were only marginally affected by wear. In some of the more heavily worn mandibles, the scratch lines become more and more obscured as the abraded surfaces are totally smoothed, leaving only some “erratic”, transversely running marks clearly discernible. In other specimens, a dense and rather coarse pattern of striations is maintained even in advanced stages of wear. Differences in

the substrate to which the mandibular bases were exposed are thought to be responsible for these inconsistencies.

## WHY 7? RULES AND EXCEPTIONS IN THE NUMBERING OF DICE

**Hans Christian Küchelmann**

A common and rarely questioned rule is that the opposite sides of dice add up to seven. A look through history will show that this is an almost feature from the oldest known bone dice until today. Nevertheless there are exceptions. Starting with two irregular finds from Germany, this paper shall shed light on the development of this rule, on possible motifs and their backgrounds, and on possible reasons for known exceptions. A question addressed to the audience will be how many irregular finds occur elsewhere and an implicated aim is to evoke discussion about the topic.

## POSSIBLE FUNCTION OF KNIVES MADE FROM RIBS (ON THE BASIS OF ESTONIAN VIKING AGE FINDS)

**Heidi Luik and Liina Maldre**

About twenty-five knives and knife fragments made from ribs have been found from Estonian archaeological sites of the Viking Age. Most of the finds were recovered from the hill fort of Iru and the settlement site of Pada (about ten fragments of bone knives from each). Some fragments were found from among the faunal remains from the settlement site of Linnaaluste. Some of the knives from the settlement site of Pada were also found when analyzing the recovered faunal remains. Another bone knife was found from the Põide hillfort, Saaremaa, but it differs from the others by shape and is not



made of a rib. The knives that are better preserved and thus can be determined to species are made of cattle ribs. With smaller fragments it is impossible to identify species. We do not know what these tools were used for. It has been presumed that they were used for processing hides. To determine the possible fields of use we studied their wear traces with a microscope. All the sites, which have provided such bone knives, belong to hillfort-and-settlement system, which consisted of a fort and an open settlement. Such hillforts with settlements were centers of authority in the Viking Age Estonia. The question whether these tools were connected with handicrafts or trade in these centres is of special interest. Were these bone knives used for making some artefacts, or were they used for processing furs, which could have been an important object of trade in these centers?

## CRUDE ADZES: FOCAL ON SPECIAL AND UNKNOWN ARTIFACT TYPE

**Isabelle Sidéra**

This poster aims to make known a special artifact type : a broken long bone (femur, humerus, even tibia or metapodial) with its epiphysis used as an handle, and the break, as a cutting edge. Because no further shaping occurred, its aspect does not differ from a faunal remain. For this reason, it has rarely been identified within bone collections.

D. Stordeur first identified some in Syrian (end of PPNA) and Anatolian (PPNB) collections. P. Watson signaled one in Iraq. Some items were found in the first south-eastern European Neolithic from Kovacevo (Bulgaria) and many, in the Chalcolithic, at Drama (Bulgaria). It has been also attested, recently, in the western European Neolithic.

These tools, with an unusual story, deserve to be described in detail so as to help researchers to identify them and further document their chronological and geographical distribution. They offer an example of a very long-lasting existence and of an extraordinary spread. Furthermore, they address the question of their manufacture, which contrasts strongly with the very elaborated other artifacts. Their function, for which many hypotheses have been suggested, must be also investigated. We propose here to treat all these questions around an illustrated description of this artifact type.

## OTTOMAN TURKISH PERIOD IVORY COMBS FROM THE LOWER CASTLE IN VISEGRÁD, HUNGARY

**István Kováts**

The double fortification system of Visegrád in the Danube Bend gorge, was built around 1250–1260 by King Béla IV and his wife queen Maria Lascaris. Major elements of this system were further developed in several periods during the 13th–16th centuries.

The Lower Castle, with the so-called “Salamon” habitation tower in its center, represents a building complex that served as a royal accommodation, bayliff’s habitation and a fortified military feature during the Middle Ages. Its function of defense and control, however, was gradually lost during the first half of the 16th century, in the face of Ottoman Turkish occupation.

Following 1544, with an exception of a ten years period, Visegrád fell under Ottoman Turkish rule for 140 years. The settlement of Turkish military (largely southern Slavic in ethnic origins) was created in the immediate proximity of Salamon Tower. Simple living quarters of the 16–17th century inha-

bitants, as well as a great number of refuse pits with rich Turkish Period find material came to light in this terraced territory.

A significant number of artifacts made from osseous materials were found during the excavations of this settlement. In addition to objects carved from animal bone and antler, as well as débitage related to workshop activity, ivory carved into a comb was recovered as well.

In addition to the short description of manufactured bone and antler, this paper concentrates on the detailed analysis of ivory artifacts. Within this framework, find contexts, manufacturing techniques as well as elephant ivory manufacturing and trade of the Ottoman Turkish Empire will be discussed. Finally, a brief review of direct antecedents in Hungary and the Balkans will be presented, in relation to the main trends that characterize ivory carving in the 11-16th centuries.

## EXPERIMENTAL ASSESSMENT OF OLD RECIPES FOR COLORING BONE FROM 12-15 CC. AD

**Ivan Chokoev**

Excavating ancient and medieval sites the archaeologists occasionally come across colored bone objects. The prevailing numbers among them are colored in green and various shades of red. Such finds provide us with the rare opportunity for parallel evaluation of archaeological data against written sources. Starting from Lucca manuscript (8<sup>th</sup> c. AD) and Theophilus (12<sup>th</sup> c. AD) down to Jehan Le-Begue and Bolognese manuscript and Strassbourg manuscript (all three from 15<sup>th</sup> c. AD), coloring is the most frequent occasion for mentioning bone working. Subject of this report is our experimental results following some of the recipes listed in the above named sources.

## THE PRODUCTION OF BONE NEEDLES IN ANCIENT OSTIA (ROMA – ITALY)

**Ivana Fiore, Linda Russo, Jane Shepherd, Antonio Tagliacozzo**

The study of a group of bone objects found in the excavations of Roman Ostia, the harbour city of Rome, is presented. Ancient tradition said that the city had been founded by king Ancus Marcius in the 7th century B.C., though archaeological finds go back no earlier than the 4<sup>th</sup> century B.C. In the 2<sup>nd</sup> century A.D. the city flourished under the emperor Hadrian. From the 3rd to the 5th centuries it slowly and inexorably declined, and only sporadical traces of life are to be found afterwards. By the 9th century the city was totally deserted.

Excavations in the site have yielded for centuries many celebrated works of art but also objects used in everyday life, among these a vast range of bone objects and their manufacturing debris. The sheer number and their grouping in different areas of the city point to the existence of several bone manufacturing workshops. Apart from the classification of the whole group, a larger project is dedicated to the analysis of the working process and wear traces. In this occasion we present the results of the analysis of 111 eye needles.

All items were macro and micro analyzed, often detecting traces of manufacturing and finishing. Special attention was given to the boring techniques of the eye, often provided with multiple holes.

Wearing traces are evident on the distal and proximal ends, and also inside the eye. The shiny surface and the absence of macrostriae shows that these tools were employed in soft fabric weaving or sewing processes. As the tip of 79 needles is broken, it has been possible – in a limited number of cases- to tell the accidental fractures from the breakings that occurred during use.

## BONE TOOL TECHNOLOGY IN THE MIDDLE MISSOURI

**Janet Griffitts**

This study examines bone technology from five sites from the Middle Missouri subarea of the Northern Plains of North America. At the time of contact with Europeans and Euroamericans the Mandan, Hidatsa, and Arikara lived in semi-sedentary villages along the Missouri River where they practiced a mixed economy centered on both agriculture and bison hunting. The villagers were central in both indigenous trade networks and in the international fur trade and low levels of trade goods are found in their sites as early as the Seventeenth century.

Technological change after contact is often modeled as a relatively simple unilinear process in which metal tools quickly replaced older technologies. Analysis of modified bone and antler from historic sites indicates that processes were more complicated. Rather than destroying the older bone technology as has been suggested, initially there was a period of experimentation as people used the new metal cutting and chopping tools to work their older technology in new ways and into new forms. Some bone tools were made by simply substituting new cutting tools for old, but in other cases the new metal tools were used to create bone tools in completely different ways.

## EXPERIMENTAL EVIDENCE OF SPEARTHROWER USE IN THE UPPER MAGDALENIAN FROM THE ISTURITZ CAVE SITE (PYRÉNÉES-ATLANTIQUES, FRANCE)

**Jean-Marc Pétilon**

Archaeologists working on Paleolithic weapons have long been concerned in determining the timing of the appearance of the spearthrower and the bow. Much difficulty comes from the fact that these weapons can be made entirely of non-durable materials. The only direct evidence of spearthrower use in the European Paleolithic are the antler hooks found almost exclusively in French Middle Magdalenian deposits ; bow and arrow remains are known only from the Mesolithic onwards.

With this problem in mind, I undertook the experimental functional study of the antler projectile points assemblage from the Upper Magdalenian layer at Isturitz (Pyrénées-Atlantiques, France). This series is composed of 411 fork-based points, 121 double-beveled points and 43 foreshafts.

The experimental program was organized by Pierre Cattelain and myself. We manufactured 78 fork-based points, 18 double-beveled points and 4 foreshafts, all from reindeer antler. The points were hafted to projectile shafts, and shot with bow and spearthrower into animal carcasses until breakage.

Distal fractures affected both types of points, delivered by bow or by spearthrower. Proximal fractures, however, occurred only on the forked bases, and always resulted from a spearthrower shot. Since these proximal fractures are also frequent on the archaeological fork-based points, we can assume that these points were probably used to tip spearthrower-launched projectiles. Thus, the disappearance of antler hooks after the Middle Magdalenian does not necessarily imply that the spearthrower itself was no longer used. At least in the

Isturitz Upper Magdalenian, it seems to have persisted, probably entirely manufactured from perishable materials...

## THE BIOGRAPHY OF SPONDYLUS SHELL ORNAMENTS FROM DURANKULAK (NORTH EAST BULGARIA): TRANSFORMATION, REVELATION AND DEPOSITION

**John Chapman and Bisserka Gaydarska**

In previous studies of the Aegean thorny oyster shell (*Spondylus gaederopus*), one has the impression that the objects are being studied in order to investigate an extraneous factor (trade, local production) rather than as things in their own right. There are many aspects of prehistoric shell rings that are worth consideration as the form of the materiality in which the rings existed for past individuals and communities. The underlying concepts for making shell rings are twofold: transformation and revelation. In this context, Helms (1993) suggests that skilled crafting can be thought of as a “ritual of discovery” by which hidden patterns of nature are revealed and which can celebrate the ultimate order of the cosmos. In traditional societies, creativity refers not so much to individual artistic uniqueness as to the ordering of nature for cultural purposes.

In this biographical study of *Spondylus* shells, we focus on four main stages of the life-history: (1) manufacture; (2) use-life; (3) deposition; and (4) post-depositional history. There are five steps in the stage of making: (a) diving to recover the shell from the sea; (b) the selection of the shell for either display (small rings) or for wearing (large bracelets); (c) the selection of shells according to their natural shape, size, colour and spiny-ness; (d) the initial transformation – the grinding of the shell to remove spines, spikes and ridges; and (e) the stage

of revelation – revealing natural features through deeper grinding.

In the stage of the use-life of the shell, there are four potential steps: - (f) fragmentation; (g) wear; (h) burning; and (i) chipping. In deposition, (k) shell rings are brought together, often with other things, in a statement of integration or separation materializing the social inter-relations of the deceased. The final stage in the shell ring biography (l) is the post-depositional traces that accrete to the ring during and/or after burial. These marks are relevant to the prehistoric life history of the objects only if the rings are disinterred or robbed from the grave and brought back into an active “second life”.

The important general point here is that, because of the materiality of objects, aspects - perhaps many diverse aspects - of their life stories are recorded on the objects themselves. The object thus contains its own self-referential cultural memory, embodying parts of its own experience and aspects of the foundations of its relations with different persons.

We focus on the *Spondylus* rings from the Neolithic and Chalcolithic phases of the Durankulak cemetery as examples of the creation of remarkably diverse object biographies.

## A DECORATIVE SKULL OF RED DEER (*CERVUS ELAPHUS* L. 1758) FROM IRON AGE HUNGARY

**László Bartosiewicz**

Over 2000 animal bones from the 3rd century BCE Iron Age settlement of Sajópetri, located at the foothills of the Northern Hills in Hungary, show a marked resemblance to Scythian assemblages from the area. This means the importance of "steppe elements" such as sheep and horse among the food remains. Meanwhile, graves in the settlement's cemetery were



often furnished with cuts of pork, characteristic of Celtic ritual. These two different traditions seem to overlap in a special find from this site. The top of the neurocranium from a stag, with antlers still attached, was recovered from a post hole in the settlement. It was carefully cut off of the rest of the calvarium.

The heavily weathered external surface may be indicative of long term outdoor display, while its shape is reminiscent of the headgear worn by the Celtic god Cernunnos. In this paper, biological as well as mental aspects of this curious piece of worked bone are discussed.

## WORKED CERVIDAE ANTLERS FROM BENIAMIN AND SHIRAKAVAN SITES (ARMENIA)

**Lilit Mirzoyan, Nina Manaseryan**

Beniamin and Shirakavan archaeological sites are situated in the North-Western part of the Republic of Armenia. Beniamin settlement is dated from the 6th c BC to the 1st c AD; Shirakavan settlement is dated to the 2nd c BC – 3rd c AD. Among the numerous animal bone remains excavated from both sites postcranial skeleton and skull fragments of Red deer (*Cervus elaphus* L.) were identified. This species is now extinct on the territory of Armenia. During the research a number of cut-marks and worked surfaces were observed on the antler fragments of Red deer. In particular, two fragments from Beniamin and three fragments from Shirakavan have indisputable signs of artificial shaping. In all cases antler edges are grinded and smoothly polished. The fragments have vertical and horizontal incisions made by a sharp instrument(s). Although, all worked fragments are waste products or unfinished works, the role of these finds is still significant. Detailed analysis of them can provide with important data for interpretations concerning the abundance of Red deer. Moreover, such

material is essential to show the man's relationship with the environment and his subsistence activities.

## PROCESSING OF BONES AND IDENTIFICATION OF USE-WEAR TRACES ON THE BASE OF BONE HOE FROM THE MESOLITHIC SITE PLAWIENKO 31, POMERANIA (POLAND)

**Marcin Diakovski & Bernadeta Kufel**

In the following presentation the theoretical assumption and practical aspects concerning method of bone processing and bone tool use will be presented. Excavations of the Mesolithic sites reveal types of tools for which the process of manufacture and function are unknown or not certain. The process of manufacture and functional/typological types of tools used in manufacture are also not clear.

A Mesolithic bone mattock-head from the Mesolithic site Plawienko 31, Pomerania, Poland was carefully investigated. It was made of a metacarpus bone of female aurochs. The tool shows asymmetrical one-sided working edge on the digital extremity and a hole drilled on the opposite carpal extremity of the bone. The hole is parallel to the tool axis and probably formed for hafting. The mattock-head is 14,3 cm long and 5,4-3,1 cm wide.

The site Plawienko 31 is located on the slope of the promontory's culmination adjacent to the dried lake bed. The promontory is surrounded on three sides by dried reservoir. Trench I/93 was set on the slope and three probing trenches (A,B,C) was situated in the shore area of the dried lake. The flint artefacts in the main trench were dispersed and replaced along the slope towards the dried lake. The implement under discussion was discovered in the peat level in trench A on the site. Radio-carbon dating of the peat level was 8920±90 BP (Gd-7432).

The bone mattock-head, other organic material, included a fragment of an oar and about 30 flint artefacts are believed that they belong to the assemblage discovered in the trench I/93. Similarity in the raw-material, typology and wide dispersing of the assemblage constitute the proofs of the same origin. The analysis of the typological components showed that majority of them is identified with the Maglemosian culture, some of them with Duvensee complex (in Poland Komornica culture).

Similar mattock-heads made of radial bone of big mammals are known from Maglemose culture sites located in north-west of Germany, south of Sweden (Agerød) and Zealand (Swaerdborg, Mullerup, Kongemose, Holmegård, Lundby). Some of them are decorated. The mattock-head from Plawienko has no engravings. Such kind of artefacts from Mesolithic is uncommon in the Polish archaeological collections. It is connected with preservation processes.

Replicas of the mattock-head were reconstructed of metacarpus bone of cow. The replica can not be made of aurochs bone, this species become extinct in the 17th century. A series of experiments were conducted employing various worked material, activities and motions. The reconstruction work required different type of flint and organic tools. A few different ways of hafting were tested to determine the most efficient and comfortable way of use. Next step was comparison of wear traces observed on the Mesolithic artefact and experimental tools, what is very useful. Since the mattock-head was conserved using gloss paint, the scars and striations patterns after manufacture and use are more visible than polishes. The aim of the experiments is to determine the use of the mattock-heads and some aspects of bone processing. The experiments were conducted in the frame of the experimental project caring out in the Institute of Archaeology of Wrocław University.

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## PIERCED BONES: SHEPHERD'S TOOLS?

**Maria Dolores Lopes Gila**

The unexpected discovery of two bovid metapodials, pierced on their posterior surfaces, among the faunal remains from the Mediaeval site of Gandia (Valencia, Spain) seized our attention. The unexplained function of these artefacts motivated the present research. To date, we have identified 6 similar bones in distinct archaeological sites located in the Comunidad Valenciana (Spain).

All the identified artefacts are bovid metapodials, pierced on their posterior surfaces. They were recovered generally isolated, or in garbage pits, associated with ceramic fragments and faunal remains. Until present, researchers have associated them with Islamic contexts, within a chronological period ranging approximately from the 12th to the 15th centuries.

The absence of references and ethnographic parallels for this occurrence has rendered it difficult to understand the

purpose of these bones. For this reason, and because they are not eye catching nor very elaborately decorated, they have not been exhibited in museums and their presence has remained unidentified, among the faunal remains recovered from several archaeological sites.

Occasionally, however, they have been published in site catalogues or museum publications, classified as “flute or musical instrument”. It was precisely the fact that one visitor recognized one of these bones identified as “flute” in the Ceramic Museum in Paterna (Valencia, Spain) that directed the investigation towards ethnonological aspects previously unknown to us.

## TELESCOPES

### **Marloes Rijkelijhuizen**

In the past 35 years the Archaeological Service of Amsterdam excavated in Amsterdam over 2000 objects made of hard animal tissue. These objects date between the 12th and 19th century. The materials that were used are bone, antler, ivory, horn, tortoiseshell, baleen and hoof. Unique in Dutch archaeology are the finds of bone telescopes.

The telescope was developed around the year 1600. This invention is often attributed to two Dutch spectacle-makers from Middelburg, Sacharias Janssen and Hans Lipperhey. The demonstration of Lipperhey to the States General and the attempt to claim a patent in the year 1608 resulted in the widespread popularity and development of the telescope. Therefore the year 1608 is often mentioned as the year of the invention of the telescope. In 2008 the fourth centennial of this invention will be celebrated in Middelburg.

Five telescopes made of bone are found in Amsterdam. The telescopes are made of metatarsi of cattle. Four telescopes

consist of one part; one is made of two parts which are fixed together with screwthread. In the middle of the longer telescope the marrow cavity is reduced which gives a better optical view, because the outer rays of light are blocked. In this long telescope both lenses are preserved, and also in one shorter telescope a lens is still present. The telescopes probably have an optical system that is called the 'Dutch' or 'Galilean' system. Two of the telescopes are dated in the 18th century, the other three are of uncertain date.

#### **BONE ANVILS: NOT WORKED BONES BUT BONES FOR WORKING**

**Marta Moreno-García, Montserrat Esteban Nadal, Carlos Pimenta, Maria Dolores Lopez Gila, Isabelle Rodet-Belarbi, Arturo Morales & Jose Paulo Ruas**

Over the last decades of the 20<sup>th</sup> century, archaeologists working in the South East France, the Iberian Peninsula and Northern Morocco have come across a particular kind of bone objects fashioned primarily from cattle and horse metapodials. They present one or several faces of the diaphysis whittled down and smoothed. They feature parallel rows of triangular-shaped indentations across the longitudinal axis of the bone. Their use was by no means certain. While many remained simply as decorated bones others were interpreted as bone amulets, idols, archer's wrist guards, polishers, files, or sharpeners.

Some have been recovered from deposits associated with metal production, where large quantities of metal slag and charcoal, along with possible smelting pits and furnace remains were found. But most of them come from rubbish pits, unstratified or surface contexts, where they were probably discarded once their utilitarian potential was finished.

Making use of ethnographic information from Catalonia (Spain), Esteban Nadal managed to reveal the true function of these bone artifacts. They were used until recently by blacksmiths as anvils to anchor the blade of an iron sickle while it was being cut to make a serrated edge. Additional ethnographic evidence from other regions in Spain and Portugal confirm such practice.

## **BONE WORKING IN MEDIEVAL BULGARIA: RAW MATERIAL- OR PRODUCT-BASED CRAFT?**

**Milena Stancheva and Kiril Tomanov**

An open question in Bulgarian Medieval studies is the question about the specialization of the carvers producing bone objects. Looking for answers we have attracted data from the archaeological excavations of medieval sites (8-14 cc.), written sources and Bulgarian ethnographic research against comparative data from Western and Eastern Europe. The analysis of numerous worked bone finds clearly demonstrates that knife-makers' workshops particularly mastered the practical know-how of working bone for everyday use. Microscopic observations on the materials (metapodials, semi-finished and discarded finds) from Turnovgrad (present Veliko Turnovo) show that both in the years of the Second Bulgarian Kingdom (12-14 cc. AD) and after the Ottoman invasion (end of 14<sup>th</sup> century AD) carvers from the same family continued to produce knives along the lines of same tradition, making also bone and wooden handles for them. Our experimental work allows reconstructing both the processing stages and the tool kit of the medieval carvers. We try to calculate the number of finished products from a single bone (cattle metapodium).

Along with the knife-makers, bone and antler were used by comb-makers, turners, carvers and armourers. Our conclu-

sions about the bone working during the Middle Ages have found confirmation in Bulgarian ethnographic data that in this time the bone working was product rather than a raw material based craft.

ENGRAVED MEDIAEVAL BONE CROSS FROM THE CHURCH “ST. DIMITAR” IN V.TURNOVO (13<sup>TH</sup> CENTURY AD)

**Mirko Robov**

During the excavations of the eastern wing of the church “St. Dimitar” in the foot of Trapesitsa hill, in a layer dated to the end of 12<sup>th</sup> until the 60-ies of 13<sup>th</sup> century AD, there has been discovered a unique find made of bone.

It is a cross measuring 4.5cm in height, 2.7cm wide and 0.6cm thick. It is designed to be worn on the breast, hanging on a string running through the upper arm. A composition of thirteen figures decorates the surface on both sides together with four engraved inscriptions – three carved in negative and one in positive.

The stylistic details of the iconography of the figures as well as the paleographic characteristics of the inscriptions confirm the chronological position set by its archaeological context – the first half of 13<sup>th</sup> century AD.



# STICK'S EXTRACTION PROCESSES DURING THE GRAVETTIAN IN WESTERN EUROPE: IDENTIFICATION OF TWO UNPUBLISHED DEBITAGE PROCESSES?

**Nejma Goutas**

**Key words:** Gravettian, Osseous Industry, Groove and splinter process, Splitting and wedging process, Diachrony, Palethnology.

The many upheavals and rehandlings of French research about Gravettian since the middle of the XX<sup>st</sup> century show how difficult it is to establish an accurate chrono-cultural framework. Moreover, we have to note that the various complete studies have until now forsaken the osseous industry. The main purpose of this study is thus to clear this quasi-unexplored sphere of activity, which concerns however nearly 8.000 years of our common (pre)history, so as to lay the first foundations of the osseous industry's characterization and of its palethnological implications across the various facies of French Gravettian. Through our techno-economic approach, we will highlight some results and open new tracks for further research, which we will try to replace in a diachronic point of view.

We will see particularly that the Gravettian's osseous industry is directly conditioned by a fundamental technical innovation, named the groove and splinter process. According to the several French sites on which we worked, this one is attested since the old phases of Gravettian and seems to reach a maximum development around the middle phase with burins of Noailles. It is still employed in the recent and final phases, while its use in the facies with burins of Raysse still remains to be confirmed. During that phase, we have moreover highlighted a new phenomenon, knowing a return to the Aurignacian's process of splitting and wedging, which will still be used in recent and final Gravettian. The use of those two processes

gave rise to an "hybrid" process, which origin is also Aurignacian: the "grooving/wedging" process. We will see how these three processes "coexisted" and for which purpose Gravettiens had recourse to them. Next, we will try to find the meaning of these changes and their palethnologic implications on the origin of Gravettian and the bonds which link the various facies which make it up.

## BREAKING THE CODE: INTERPRETING THE ANTHROPOMORPHIC BONE FIGURINES FROM COPPER AGE BULGARIA

**Petar Zidarov**

Various anthropomorphic figurines made of bone are among the most characteristic features of Bulgarian Copper Age (Fifth Mill. BC). Accordingly they were among the few worked bone objects to attract common interest in the archaeological literature. However, almost hundred years since the first publication they are still mostly described along the same lines of typological classification with the attempt (similarly to ceramic studies) to assign chronological or cultural characteristics to given attributes (shape, proportions, ornamental design). This paper attempts to re-evaluate the evidence for the possible origin and semantics of the main types of figurines drawing parallels to their counterparts in Spondylus, marble, and gold. Further on their social role is assessed with regards to contextual analysis of finds from settlements and graves related to specialized production and modes of use. Finally, other bone finds providing evidence for ritual use will be brought into discussion.

## BONES SCRAPED WITH BRONZE KNIVES

**Rozalia Christidou**

We present the traces created on fresh and dry metapodials of caprines experimentally scraped with bronze knives. These knives were replicas of archaeological specimens found in Aegean Bronze Age sites. The worked bone surfaces examined under the metallographic microscope, mainly at 200x magnifications, show variability in the type, distribution, and wearing of the scraping marks depending on differences in the direction of the movement and the contact angle employed during the experiments.

## THE STAMP SEAL WITH BIRD-SHAPED HANDLE FOUND IN BAKLATEPE, EARLY BRONZE AGE THE BEGINNING OF THE 3<sup>rd</sup> PHASE

**Nurperi R. Ayengin**

Baklatepe is located at the north of Tahtalı Dam which is 30 kilometers south of İzmir city center on the west coast of Anatolia. An extramural cemetery was found dating back to the end of the E.B.A. II to the beginning of the III. In a pithos grave belonging to a middle-aged woman, a stamp seal made of antler was found among other gifts. The stamp seal has a bird-shaped handle made of antler, showing a nested bird in sitting position without an ornamented and worked face. Even though the bird is burnished, its back side is not protected in time. Right under the neck is placed a hole for the thread. The feathers are represented with lines incised on the antler especially on the bird's back, front and both sides. Because the bird is in sitting position, its legs are not shown but roughly represented. The pedestal of the stamp seal is not rectangular but curved towards the bird's position. The under side of the

stamp seal is used on the stamp. The ornamentation here is made of incisions in diamond shapes.

The stamp seal made of antler is unique due to its originality in its time period, material shape and ornamentations.

## BONE WORKING IN THE EARLY MIDDLE AGE IN MOLDOVA (6<sup>th</sup> – 11<sup>th</sup> centuries.)

**Sergiu Musteata,**

For complete the picture of the economic development and corresponding economic branches of the local inhabitants, who besides the agricultural deal also with livestock breeding, hunting and fishing, from Prut-Dniestr are during the Early Middle Age we need to study the goods made of bone and horn.

For the period comprised in centuries 6th – 11th, the investigations conducted in the Prut-Nistru space have found a series of recessed or surface constructions, similar to dwellings and dependencies but differing from them by traces of handicraft waste: metal slag and intermediary stages of finished iron, melting pots and clay casts, tools and templates. Besides, constructions have been discovered for the processing of hides, bone, horn, etc. Inside workshops researchers have found a large number of bone pierces, templates, bone cinders, etc.

In the investigated sites in Republic of Moldova, among mobile findings, important place belongs also to goods made of bone and horn. Using animal bones and horns, depending on the need and skillfulness (agriculture, hide and fur processing, spinning, weaving, dressmaking, etc.), they made tools and other objects. Although they are numerous neither various, it is possible to classify them generally into several groups (tools,

decorative and hygienic goods, goods for play and entertainment, goods of undefined purpose and semi-fabrics).

Among the objects discovered in the settlements under study are various kinds of pierces, needles, handles, combs, vertebrae and slides used in everyday life for performance of various works. Most numerous are pierces discovered practically in all settlements. They were made of small-animal bones, especially sheep and goat shins, although objects have been found which are made of splinters of other bones. Pierces made of deer antlers have also been found. These pieces vary in size between 5.0-20.0 cm. The pierce tips were sharpened by knife and then polished by grit stone.

By all means, the presentation is about goods from home production and mainly those needed in the everyday life.

## THE ROLE OF BONE IMPLEMENTS AS A REPLACEMENT OF SCARCE RESOURCES ON SAN NICOLAS ISLAND

**Tina Fulton**

San Nicolas Island, located 120km off the coast of Los Angeles, California is the remotest of all the Channel Islands. For over a century, San Nicolas has been the focus of investigation and survey, with much of the data being unpublished. The earliest known sites indicate an occupation lasting about 6000 years, with ample evidence of maritime fishing, hunting and gathering. The island has only three known terrestrial animals– the island fox, lizard and mouse, with no native trees. Various bone implements and tools have been recovered over time from different sites. Two sites in particular, CA- SNI -11 and CA- SNI -16, are important because of previous analysis, in the form of unpublished reports, and numerous examples of bone implements and tools recovered at each respective site.

Both sites are located on the Northwest coast of the Island. With further analysis of bone artifacts from CA- SNI -11 and CA- SNI -16, inferences can be made to indicate a strong subsistence on Marine Resources, not solely for food procurement. Abundant marine life in the form of sea bird and marine mammal bones were used as a resource for tools, implements and fuel, and played a significant role in the daily lives of the Nicoleños. The focus of this inquiry will be placed on the significance of bone implements as a replacement for otherwise scarce resources, which the Nicoleños would have had to import to the Island.

## ANALYSIS OF STONE AGE ARTIFACTS WITH LONGITUDINAL EDGES FROM ESTONIA

**Ulla Kadakas**

Two complementary approaches could be distinguished in archaeology: bringing forth general trends in long perspective of human society besides concentrating on study of small details, the trifles of everyday life, among which the function of single kind of tools of certain period can be studied. Archaeology describing processes on long periods has been made in Estonia over 150 years. Artefact studies, the sole purpose of which would not be chronologies, typologies or settlement strategies but pure function has been done in small extent.

Tools can be classified, arranged into typologies, chronologies, but gradations can be differentiated as well. Different artefacts of available material (e.g. stone, bone, antler, wood) with different working areas belonged to the set of primary tools among which the tools with longitudinal edges played an important role. Our everyday objects are incomparable to the objects that surrounded the people of Stone Age as well as the needs. Because of the present-day specialization which would

probably look grotesque to Stone Age people, most of us do not need the most essential tools for them like knife, chisel or axe.

The archaeological collection of the Museum of Pärnu includes a large assemblage of stray finds gathered from the lower reaches of river Pärnu during the 1st half of the 20th century. A special attention has always been paid by Estonian archaeologists to these assemblages due to their diversity and beauty. In essence the archaeological value of these finds has gradually diminished because they have come as stray finds unstratified from a period of several millennia long and such obscure find context does not offer a solid basis for a chronological and typological approach. Variability of the artefacts with longitudinal edges, by far the most numerous kind of tools in the assemblage, can still be analyzed. Based on a supposition supported by stratigraphy, that these artefacts come from a period when the inhabitants of Estonia lived of hunting, fishing and gathering, it could be possible to guess the everyday occupations of the owners of the artefacts using measure statistics, analogies and other criteria.

## THE “COGGED SCAPULAE” OF THE LATE BRONZE AGE: DISTRIBUTION, TECHNOLOGY, FUNCTION

**Valentin Pankovskiy**

Scapulae with cogs cut at the edge of the cavitas glenoidalis (“omoplat crestat” in Roumanian) are the focus of the paper. Approximately 77 sites of ca 300 objects are known. These sites attributed to Noua (phases I, II), Sabatinovka, Tei (phases IV, V), Coslogeni, Wietenberg and Timber-grave (“Zrubna”) culture. Similar objects occur at the settlements of mixed traditions. Forty Noua sites vis-à-vis twenty-five sites of

Sabatinovka demonstrate almost equal distribution of finds because of distinction in character of settlements.

Raw materials: cattle, horse and red deer scapular bones. Related cogged implements made of horse metatarsus III and phalanx III and cattle os pubis and os humeri. The blanks obtained by splitting the bone with tool stuck into the basis scapulae or by punching the fossa infraspinata. Cutting cogs with bronze knife is usual; sawing is rare.

Bone-carving and fur-processing experiments were carried out. It is established that “cogged scapulae” are parts of stationary tools for breaking sheepskins in furriery. This kind of tool consisted of vertically installed wooden shaft and bone strung with cord or thong on shaft’s top. Proposed analogies are Chalcolithic tool of Varna culture (Skakun 1999) and Paleolithic object from Kostenki I (Semenov 1964).

## FRAGMENTATION IN THE UPPER PALEOLITHIC LAYERS IN KOZARNIKA CAVE: PRELIMINARY RESULTS

**Viviana Miteva**

Key words: Kozarnika cave, Upper Paleolithic, taphonomy, fort fragmentation, anthropic origin.

The upper Paleolithic assemblages from Kozarnika cave are characterized by the high degree of fragmentation of the fauna and that is valid for the earliest assemblages from the early and upper Paleolithic. From the point of view of the taphonomy this problem is very interesting and in the scientific bibliography it is not really well discussed even in the last years there is a tendency to study the fragments smaller than 4 cm. For us the most important is to find an origin, anthropic or no, and if the answer is positive if the fragmentation is



connected with the type of the site (hunting camp), with the nutritive regime or with the climatic changes. To give an answer to those questions we already started an experimental program of fragmentation of different kind of bones. Our preliminary results show that minimum one part of the fragmentation is of anthropic origin.

## EARLY MEDIEVAL BONE OBJECTS FROM BAJČ, SW SLOVAKIA.

**Zora Miklíková**

The poster is focused on the analysis of worked bones retrieved from the largest early medieval archaeofaunal assemblage from Slovakia up to date. In the years 1987 - 1994 a complex archaeological excavation of the rural settlement in Bajč-Medzi kanálmi (district Komárno, southwestern Slovakia) was carried out. The highest density of occupation at the site comes from the 6th – 11th century AD. From the archaeozoological point of view, a total of 402 archaeological features, among which sunken huts, exterior clay ovens, shallow and deep storage pits, roasting pits, system of canals and human graves were present, have been recently evaluated. The osteological remains consist almost exclusively of domestic animals with predominance of cattle and caprines. Rather exciting were numerous finds of worked bones altered by humans in order to provide bone implements or ornaments. Within this collection, bone points of various lengths were most frequent. Bone skates were the second most abundant type of the find. The fragmentary remains of two bipartite bone combs, antler handle of iron knife, bone garniture of reflex bow and bone ring belong to the most outstanding finds. Presented results show an attempt of the typological classification of the collected worked bones according to their osteology, shapes, dimensions, use wears, traces of manufacturing as well as the archaeological context.