ALEXANDRU IOAN CUZA UNIVERSITY of IAȘI

INSTITUTUL DE ARHEOLOGIE IAȘI

COMPLEXUL MUZEAL NAȚIONAL MOLDOVA IAȘI

International Council for Archaeozoology

Worked Bone Research Group

11th Meeting of the ICAZ Worked Bone Research Group

PROGRAMME AND ABSTRACTS

Iași, Romania, 23-28 May 2016

Alexandru Ioan Cuza University of Iași
Faculty of Biology
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International Council for Archaeozoology

11th Meeting of the Worked Bone Research Group
23 – 28 May 2016, Iași, Romania

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"Alexandru Ioan Cuza" University of Iaşi
Faculty of Biology

In collaboration with:
Institute of Archaeology Iaşi
"Moldova" National Museum Complex of Iași

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Staff of *Bucovina Village Museum* (Suceava, Romania),
Museum of Cucuteni Chalcolithic Art (Piatra Neamț, Romania)

Cover: bone artefact discovered at Niculiţel, 2nd century AD; photo: George Nuţu, Eco-Museum Research Institute, Tulcea, Romania

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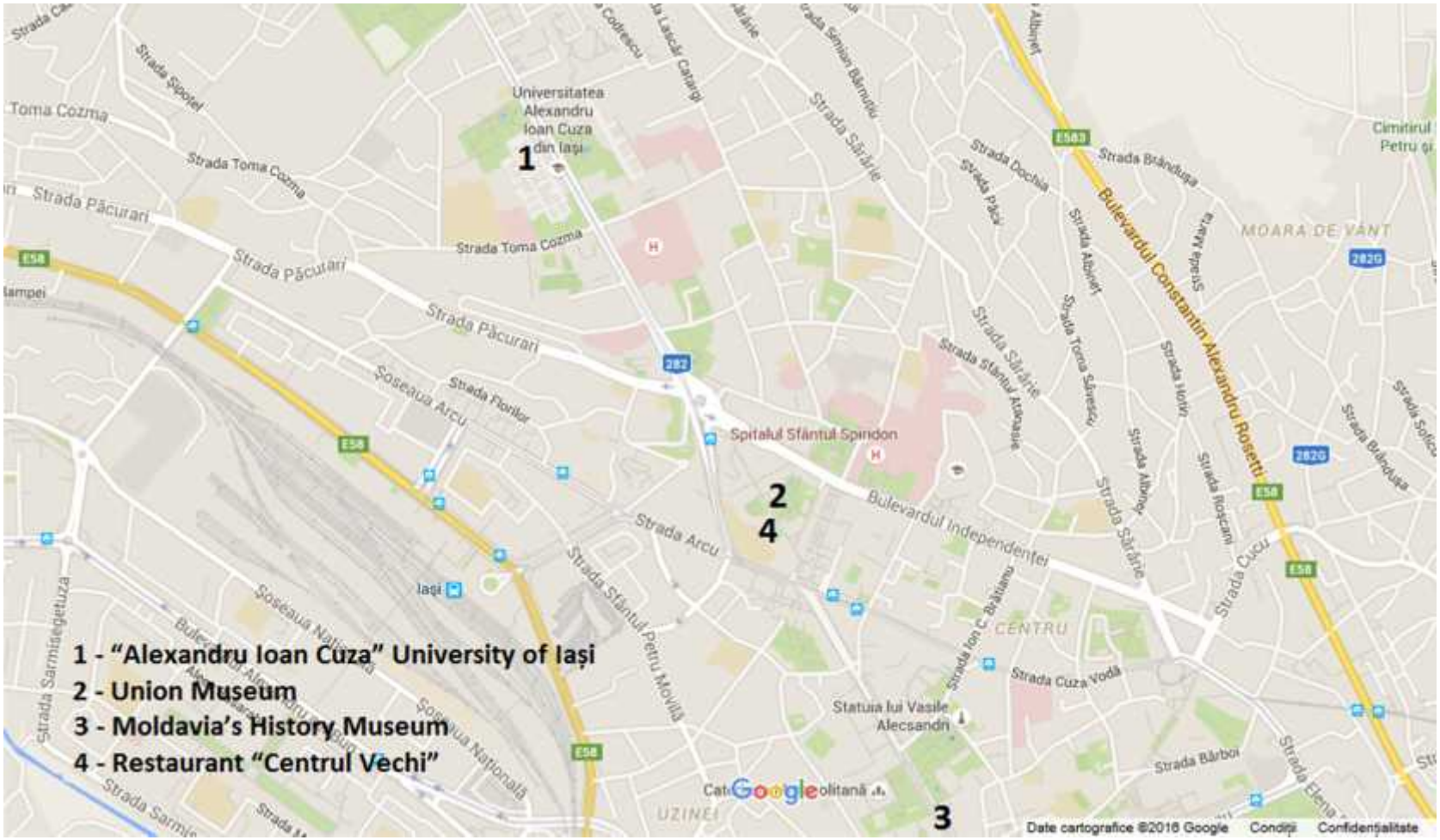
1 - “Alexandru Ioan Cuza” University of Iași
2 - Union Museum
3 - Moldavia’s History Museum
4 - Restaurant “Centrul Vechi”
Universitatea Alexandru Ioan Cuza din Iași
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PROGRAMME

Schedule of Presentations

Monday, 23 May

"Ferdinand" Conference Room,
"Alexandru Ioan Cuza" University of Iași, "A" Building, first floor
Carol I Boulevard, No. 11, 700506 Iași

9^{00}–11^{00}	**Registration of participants**
11^{00}–12^{30}	**Opening session**
	Welcome words from the university staff
	Alice CHOYKE: *A look back at the work of the ICAZ Worked Bones Research Group*
	Discussions
12^{30}–13^{00}	Coffee Break
Oral presentations "Ferdinand" Conference Room Session Chair: Pam Crabtree	
13^{00}–13^{20}	Éva DAVID: *Functional aspects of incised engraving*
13^{20}–13^{40}	Justin BRADFIELD: *Results of use-trace analysis on pointed bone tools from southern Africa*
13^{40}–14^{00}	Ninna MANASERYAN, Nora YENGIBARYAN: *Bone Arrowheads Discovered in Armenia*
14^{00}–14^{20}	Jesus TAPIA, Marian CUETO, Esteban ÁLVAREZ-FERNÁNDEZ, Julián BÉCARES: *Bone industry in the Lower Magdalenian in Cantabria Spain: El Cierro Cave (Ribadesella, Asturias)*
14^{20}–14^{40}	Monica MĂRGĂRIT, Adina BORONEANȚ, Clive BONSALL *Exploitation of Cervus elaphus antler during the Mesolithic in the Iron Gates: A comparison between the sites of Icoana and Ostrovul Corbului*
15^{00}: Welcoming Reception *The Hall of the Senat*, "Alexandru Ioan Cuza" University of Iași	

Tuesday, 24th May 2016

Registration of participants	
Oral presentations "Ferdinand" Conference Room Session Chair: Alice CHOYKE	
9^{00}–9^{20}	Valentin RADU, Monica MĂRGĂRIT, Valentina VOINEA, Kristine MARTIROSYAN-OLSHANSKY, Ruben BADALYAN, Adina BORONEANȚ, Migdonia GEORGESCU: *Processing the spur-thighed tortoise carapace (Testudo graeca) in Prehistory. Case studies from Romania and Armenia (8th to 5th millennium BC)*
9^{20}– 9^{40}	Vuk KOLDŽIĆ: *Neolithic bone working: Recognizing craft production in Vinča culture*
9^{40}–10^{00}	Saiji ARAI, Farhad GULIYEV, Yoshihiro NISHIAKI: *Evolution of Worked Bone Industry in the Neolithic Southern Caucasus*
10^{00}–10^{20}	Pia WISTOFT NIELSEN: *Osseous Material in the Southern Levant in the PPNB. Strong Technological Traditions in the Production of Bone Tools and Objects*
10^{20}–10^{40}	Monica MĂRGĂRIT, Pavel MIREA, Valentin RADU: *The exploitation of the aquatic resources for the adornments and tool manufacturing in the Neolithic settlement from Măgura "Buduiasca" ("Boldul lui Moș Ivănuș")*
10^{40}–11^{10}	Coffee Break

11^{10}–12^{30} Poster Session

The Hall of the Echoing Footsteps, "Alexandru Ioan Cuza" University of Iași
Session Chair: Simina RAFAILĂ-STANC

Justyna ORŁOWSKA: *The single-row harpoons with distinguished shaft from Polish Lowland - some technological issues*

Grzegorz OSIPOWICZ, Aleksandra LISOWSKA-GACZOREK, Daniel MAKOWIECKI, Tomasz PŁOSZAJ, Laurie J. REISEMA, Krzysztof SZOZTEK, Henryk WITAS: *New ornamented 'bâton percé' from central Poland. Evidence for a long-range exchange in early Mesolithic Europe?*

Grzegorz OSIPOWICZ, Daniel MAKOWIECKI, Ryszard GRYGIEL, Justyna KURIGA: *Middle Neolithic workshop producing bone chisels from site in Osłonki. Preliminary results of multi-faceted studies.*

Grzegorz OSIPOWICZ, Mariusz BOSIAK, Justyna KURIGA: *New studies on the Stone Age bone and antler softening methods at the Institute of Archaeology, Nicolaus Copernicus University (Poland)*

Selena VITEZOVIĆ: *To catch a fish, so juicy, sweet… Some aspects of manufacturing hooks in the Vinča culture: case study of Gomolava*

Alexandra COMȘA: *A metatarsal bone of a bovid shaped as a chisel in the Eneolithic necropolis from Ostrovul Corbului (Mehedinți County, Romania)*

Hristina PAVKOVA, Petar ZIDAROV: *Making holes: techniques for perforating heavy duty antler tools in the Eastern Balkans during the Copper Age*

Lenka JURKOVIČOVÁ, Sandra SÁZELOVÁ, Bibiána HROMADOVÁ: *The human-animals relationship in bones: analysis of cut-marks from Early Bronze Age site Pasohlávky (Czech Republic)*

Corneliu BELDIMAN, Diana-Maria SZTANCS, Berecki SÁNDOR: *Bronze Age adornment made of human tooth discovered in Transylvania*

Neculai BOLOHAN, Andreea VORNICU, Luminița BEJENARU: *Bones, tools and some other stories about recent archaeological survey in Eastern Romania*

Jesus TAPIA, Esteban ÁLVAREZ-FERNÁNDEZ, Rodrigo PORTERO, José SASTRE, Patricia FUENTES: *Bone industry during the Late Antiquity in Northern Spain: the Castro of El Castrillon (Santa Eulalia de Tábara, Zamora)*

Dan ELEFTERESCU: *The Sewing Needles from Durostorum (Ferma 4-Ostrovit)*

Hasret GARAN: *Bone Workshop and Artefacts in Perge*

George NUȚU, Simina RAFAILĂ-STANC: *Worked Bone and Antler from Halmyris. An Insight on Everyday Life of a Frontier Post of Later Scythia Province*

Natacha BUC, Maria Laura LOPEZ, Metías MEDINA: *Use-wear and residue analysis of a late prehispanic notched bone tool from Boyo Paso 2 (Sierras de Córdoba, Argentina)*

Ludmila BACMENCO-PÎRNĂU, Luminița BEJENARU: *Bone and antler artefacts in the medieval cities of Moldova. Case study: Old Orhei (Republic of Moldova)*

12^{30}–14^{00}	Lunch Break

15^{00}: Exhibition – *From Nature to Culture: the Art of Processing Bone and Antler*
Union Museum, ”Alexandru Lăpușneanu” Street, No. 14, Iași

Exhibition organised by:

Moldavia’s History Museum within ”Moldova” National Museum Complex of Iași

in cooperation with:

Bucovina Museum of Suceava
County History Museum of Botoșani
”Iulian Antonescu” Museum Complex of Bacău
Museum Complex of Neamț County (History and Archaeology Museum of Piatra-Neamț & History Museum of Roman)
Museum of the ”Alexandru Ioan Cuza” University of Iași
”Ștefan cel Mare” Museum of Vaslui County
”Vasile Pârvan” Museum of Bârlad
Institute of Archaeology Iași

Wednesday, 25th May 2016

Oral presentations "Ferdinand" Conference Room, Session Chair: Selena VITEZOVIĆ	
9^{00}–9^{20}	Angela FUGGI, Beatriz PINO URIA, Pierre MAGNIEZ, Antonio TAGLIACOZZO: *Red deer exploitation strategies during ancient Neolithic in central Adriatic Italy: the case of Colle Santo Stefano (AQ).*
9^{20}–9^{40}	Andreea VORNICU: *Bone industries in Eastern Carpathian region at the transition from Neolithic to Chalcolithic*
9^{40}–10^{00}	Isabelle SIDÉRA, Andreea VORNICU, Luminița BEJENARU: *Playing with knucklebones in the Prehistoric Balkans*
10^{00}–10^{20}	Senica ȚURCANU, Andreea VORNICU: *The manufacturing of adornments from freshwater shells in the East Carpathian Chalcolithic*
10^{20}–10^{50}	Coffee Break
10^{50}–11^{10}	Petar ZIDAROV: *Perforates antler "bâtons" from the Copper Age in the Eastern Balkans*
11^{10}–11^{30}	Valentin RADU, Monica MĂRGĂRIT, Cătălin LAZĂR: *Evidence of production and use of Lithoglyphys naticoides beads in the Holocene from Europe: the case of Sultana-Malul Roșu site (Romania)*
11^{30}–11^{50}	Douglas V. CAMPANA, Pam J. CRABTREE: *Worked Bone Objects from the Chalcolithic Levels of Çiftlik/Tepecik, Southern Cappadocia, Turkey*
11^{50}–12^{10}	Alice M. CHOYKE: *Bell-Beaker Folk along the Danube: Their Osseous Technology*
12^{30}–14^{00}	Lunch Break
15^{00}–18^{00}: Workshop: bone preparation for manufacturing "Ferdinand" Conference Room, Proposal: Paul STOKES Moderator: Éva DAVID	
19^{00}: Gala Dinner Restaurant "Centrul Vechi", "Alexandru Lăpușneanu" Street, No. 1, Iași	

Thursday, 26th May 2016

Oral presentations "Ferdinand" Conference Room Session Chair: Petar ZIDAROV	
9^{00}–9^{20}	Xenia POP, Florin GOGÂLTAN: *Primary analysis of the artefacts made from hard animal materials from Pecica-"Santul Mare/Nagysánc" Bronze Age site*
9^{20}–9^{40}	Manuel ALTAMIRANO GARCIA, Eva ALARCÓN GARCIA: *Bone tools for the deceased. Approaches to the worked osseous assemblage from the funerary Bronze Age cave of Biniadris (Menorca, Spain)*
9^{40}–10^{00}	Kinga WINNICKA: *Epi-Corded Ware objects of personal use made of bone: their materiality and meaning - a project overview*
10^{00}–10^{20}	Corneliu BELDIMAN, Diana-Maria SZTANCS, Berecki SÁNDOR, Costel ILIE: *Bronze Age artefacts made of animal shoulder blades. Methodological issues of technological study*
10^{20}–10^{50}	Coffee Break
10^{50}–11^{10}	Selena VITEZOVIĆ, Jovan MITROVIĆ: *Antler technology in the Bronze Age: The case study of Zók*
11^{10}–11^{30}	Marta BLASCO-MARTÍN, Consuelo MATA-PARREÑO, Lucía SORIA-COMBADIERA, Mercedes FUENTES-ALBERO, Eva COLLADO-MATAIX, Ignacio FUERTES-CABO: *Raw material, gestures, objects. An approach to the work of bone and ivory in the Iron Age in the Iberian Peninsula*
11^{30}–11^{50}	Ariel SHATIL: *The assemblage of bone artefacts from Iron Age IIa Tel Rehov - a typological and technological analysis*
11^{50}–12^{10}	Lóránt VASS: *Bone-working in Roman Aquincum. Fashion, tradition, use. A contextual analysis of the Roman artefacts*
12^{30}–13^{30}	Lunch Break
Oral presentations "Ferdinand" Conference Room, Session Chair: Luminița BEJENARU	
13^{30}–13^{50}	Erik HRNČIARIK: *Barbarian bone and antler industry from Slovakia (1.-5. century AD)*
13^{50}–14^{10}	Ayça GERÇEK: *Bone and ivory objects from Arykanda: a preliminary evaluation*
14^{10}–14^{30}	Daniel CIUCALĂU, Andreea VORNICU: *Amulets for the dead? The prismatic antler pendants from Sântana de Mureș culture*

14^{30}–14^{50}	Marta BLASCO-MARTÍN, Gilberto PÉREZ ROLDÁN, Gabriela INÉS MEJÍA APPEL: *Needles made of human bones from Xochimilco (Mexico)*
15^{00}: Visit to the Moldavia's History Museum within "Moldova" National Museum Complex of Iași (Palace of Culture) "Ștefan cel Mare și Sfânt" Square, No. 1, Iași	

Friday, 27th May 2016

Excursion in North-Eastern Romania (visiting prehistoric sites and medieval painted churches-UNESCO sites).

7^{45}: departure from Iași, "Alexandru Ioan Cuza" University of Iași, "A" Building

Saturday, 28th May 2016

9^{00}–11^{00}: Closing of the conference (conclusions; discussion about the next meeting in Granada, Spain, in the Spring of 2017, presented by Manuel Altamirano Garcia).

ABSTRACTS

(in order of appearance)

Éva DAVID, Laboratoire Préhistoire et Technologie, Maison Archéologie Ethnologie, Université Paris Ouest Nanterre-La-Défense, Nanterre Cedex, France

Functional aspects of incised engraving

Often archaeological osseous remains display engravings in the form of one or several cutting marks or notches that are directly interpreted as being an expression of art. The revisiting of portable art pieces by means of a technological approach entailed new issues on the value of the engravings. Presentation will expose several cases for which different interpretation can be suggested albeit the incisions they display on the bone surface look similar.

Justin BRADFIELD, University of the Witwatersrand, Johannesburg, South Africa

Results of use-trace analysis on pointed bone tools from southern Africa

Bone tools represent an important but often understudied aspect of past material culture. Apart from some notable exceptions, bone tool studies are still dominated by typological descriptions. This paper reviews the history and current state of bone tool functional studies in southern Africa. I present the results of use-trace analyses of 378 bone points from 12 archaeological sites spanning the last 18 000 years. The results suggest that manufacturing techniques remain unchanged for most of the time span considered. Damage on the distal ends indicates that not all bone arrow points were pointed, but that some arrows may have included a metal or stone tip. On certain specimens, use-wear and residue remains suggest that at least some bone points (morphologically identical to San bone arrow components) may have been used to process plant material. Whether they were used solely for this purpose or as multifunctional tools is uncertain. The most variability in use-trace indicators on bone points occurs after 4000 BP. Such changes in bone point form and function do not correlate neatly with lithic technological oscillations. It is not certain to what extent this pattern is a reflection of taphonomic conditions.

Ninna MANASERYAN, Scientific Center of Zoology and Hydroecology, National Academy of Sciences of the Republic of Armenia, Yerevan Republic of Armenia
Nora YENGIBARYAN, Institute of Archaeology and Ethnography, National Academy of Sciences of the Republic of Armenia, Yerevan, Republic of Armenia

Bone Arrowheads Discovered in Armenia

Bone made arrowheads are distinctly different from all other forms of artefacts of Armenia's ancient material culture. Such arrowheads were discovered either from the settlements (Aratashen, Aknashen, Shengavith, Kethy, Shirakavan, Erebuny, Norashen) and the tombs (Stepanavan, Bjni, Hayravank, Artik).
That mammal-bone made weapons has been known in Armenia from the Neolithic monuments and continues until the Early Armenian Period.
Bone arrowheads usually imitate the different time periods bronze, iron and stone made samples. It is also possible that the forms of the arrowheads have been adapted to the shape of the processed bone. According to the arrow shape the discovered arrowheads have been divided into several types.
In the cross section, the arrows appear in rhombical, triangular, as well as oval shapes. The arrowheads have sharp serrated edges. The tangs of the arrowheads demonstrate a diversity of designs. The variety and the abundance of the bone arrowheads indicate that they were produced locally.

Jesus TAPIA, Sociedad de Ciencias Aranzadi, Donostia-San Sebastián, Spain
Marian CUETO, Universitat Autònoma de Barcelona, Spain
Esteban ÁLVAREZ-FERNÁNDEZ, Universidad de Salamanca, Spain
Julián BÉCARES, Universidad de Salamanca, Spain

Bone industry in the Lower Magdalenian in Cantabria Spain: El Cierro Cave (Ribadesella, Asturias)

El Cierro Cave (Ribadesella, Asturias, Spain) is a classic site in the study of the Cantabrian Lower Magdalenian since is was first excavated in 1959. Bone artifacts, lithics and mobile art from this site were then relevant to discuss, from a typological standpoint, the boundaries between Solutrean and Lower Magdalenian periods in northern Spain. In this study we present a new collection of deer antler remains that include blanks, waste products and finished tools, allowing us to approach technological choices and behaviour of Lower Magdalenian hunters of El Cierro. Our

reconstruction of the Chaîne opératoire shows diverse techniques of blank production set aside to produce thick projectile points.

Monica MĂRGĂRIT, Faculty of Humanities, Valahia University of Târgoviște, Romania
Adina BORONEANȚ, "Vasile Pârvan" Institute of Archaeology, Bucharest, Romania
Clive BONSALL, University of Edinburgh, United Kingdom

Exploitation of *Cervus elaphus* antler during the Mesolithic in the Iron Gates: A comparison between the sites of Icoana and Ostrovul Corbului

According to the radiocarbon data, both Icoana and Ostrovul Corbului (Mehedinți County) were inhabited during the Late Mesolithic (ca. 7200-6300 cal BC). Both sites yielded significant numbers of artefacts made of *Cervus elaphus* antler. The purpose of this study is to establish, by comparison, if a unitary Mesolithic châine opératoire exists, or there are features characteristic of each site. On the one hand, a common element for both sites is the predilection for the volume exploitation of blanks, and very few examples of longitudinal debitage. The typological repertoire is also quite similar: bevelled objects are predominant, reflecting a specialization in certain activities, such as wood processing. Moreover, products and sub-products of the châine opératoire were identified, suggesting in situ manufacture of the finished products. On the other hand, the exploitation both of unshed and shed antler is characteristic of the Ostrovul Corbului site suggesting two raw material acquisition strategies: both hunting and raw material gathering expeditions. At Icoana, the absolute lack on the antler's basal areas does not allow for suppositions regarding the manner of raw material acquisition. In this case, the question is if the antler was somehow segmented outside the site and only the segments that were to be transformed into tools were brought in. Therefore, in spite of the overall unitary picture, we can also identify elements that were specific to each site and for which we cannot determine whether they were generated by economic or cultural factors.
Acknowledgments: This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS – UEFISCDI, project number PN-II-RU-TE-2014-4-0519.

Valentin RADU, National Museum of Romania History, Bucharest, Romania
Monica MĂRGĂRIT, Faculty of Humanities, Valahia University of Târgoviște, Romania
Valentina VOINEA, National History and Archaeology Museum, Constanța, Romania
Kristine MARTIROSYAN-OLSHANSKY, University of California, Los Angeles, USA
Ruben BADALYAN, Institute of Archaeology and Ethnography, National Academy of Sciences, Yerevan, Armenia
Adina BORONEANȚ, "Vasile Pârvan" Institute of Archaeology, Bucharest, Romania
Migdonia GEORGESCU, National Museum of Romania History, Bucharest, Romania

Processing the spur-thighed tortoise carapace (*Testudo graeca*) in Prehistory. Case studies from Romania and Armenia (8th to 5th millennium BC)

The spur-thighed tortoise is a widespread reptile in the Eurasian area, especially in the steppe climate areas. The presence of shell remains and other anatomic elements among the household waste confirms that the spur-thighed tortoise was consumed as food in Prehistory. Taking advantage of the natural shape of its carapace, prehistoric humans used it as a container for various products and not only. The presented study was developed on carapace remains presenting both processing and use-wear traces. These originate from the Mesolithic site at Icoana (Romania), from a context dated probably to the 8th millennium BC, the Neolithic sites Masis Blur and Aknashen (Armenia) dated to the 6th millennium BC, and Eneolitihic site Cheia from beginning of the 5th millennium BC (Romania).
The present study aims to reconstruct the transformational stages from the natural shell to the final product. It has been noticed that, sometimes, the final objects differ between the two regions. In Romania, the carapace processing involved the removal of the plastron and, in the case of Cheia, of all peripheral plates but the anterior one. All peripheral plates were present on most objects from Armenia. The technological intervention was minimal and consists only in cutting off the unnecessary parts and, sometimes, in polishing the debitage side. Various types of residues and, substantial use-wear were noticed on the inner surfaces of the carapace as a result of its use as utilitarian object.
This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-II-RU-TE-2014-4-0519.

Vuk KOLDŽIĆ, Institute of Prehistoric Archaeology, Freie Universität Berlin, Germany

Neolithic bone working: Recognizing craft production in Vinča culture

Late Neolithic and early Eneolithic Vinča culture yielded many finely produced objects, showing considerable technology in this transitional period in Southeastern Europe. However, the presence of craft specialists is still discussed, especially when it comes to the bone industry. During the first phases of my research dealing with this topic, several questions emerged. Some methodological and terminological issues of recognizing specialized bone working will be addressed in this presentation. More attention will be paid to the indirect evidence, since no workshop has been located yet. Also, the potential evidence and hypotheses dealing with the possibility of specialized production in different Vinča materials will be considered.

Saiji ARAI, University of Tokyo, Japan
Farhad GULIYEV, Institute of Archaeology and Ethnography, Azerbaijan National Academy of Science
Yoshihiro NISHIAKI, University of Tokyo, Japan

Evolution of Worked Bone Industry in the Neolithic Southern Caucasus

In the Southern Caucasus, comprising the northern end of the Greater Near East, the earliest evidence of Neolithic culture occurs at the beginning of the 6th millennium BC. The eastern and western parts of this region display different processes of Neolithization. Of these, this paper is concerned with the process in the eastern region, represented by the Shomutepe-Shulaveri culture. The major features of the Shomutepe-Shulaveri culture include: circular mud-brick buildings connected by walls with one another; obsidian-dominated lithic industry; coarse pottery, occasionally decorated with clay appliqué; rich bone industry; economy substantially based on domesticated plants and animals as well as a limited amount of wild resources. All of these characteristics have been thought to appear at around 6,000 BC.

In this paper we give the results of a series of analyses on worked bone industry from two Shomutepe-Shulaveri sites in Western Azerbaijan: Hacı Elamxanlı Tepe (ca. 5950–5800 BC) and Göytepe (ca. 5650–5450 BC). Comparisons in the quantity, typology, raw material selection and manufacturing technology revealed clear differences between these two sites, showing an “evolution”. The evolution of worked bone industry most likely reflects the development of Neolithic life-ways in this region. In addition, this paper refers to a typological study of unique tool-types in the earliest stage, which gives us an insight into the origin of Shomutepe-Shulaveri

culture.

Pia WISTOFT NIELSEN, Christian-Albrechts Universität zu Kiel, Germany / University of Copenhagen, Denmark

Osseous Material in the Southern Levant in the PPNB. Strong Technological Traditions in the Production of Bone Tools and Objects

The long transition from hunting and -gathering to food production marks a major change in the ways in which humans interacted with the landscape, exploited ecological zones and modified and domesticate plants and animals.
Early and Middle PPNB sites like Beidha and Shkarat Msaied both show large amount of goat remains, but still has a large variety of remains from a diverse number of other species, which indicates that different subsistence strategies were utilised at both places.
Despite the many changes taking place during the PPNB, strong traditions concerning the production of bone tools and objects continued for some types of implements. This is evident in the worked bones assemblages with their similarities in regards to bone implement (tool) types, bone element choices and the various manufacturing techniques applied.
This paper will present the results of the analysis from three PPNB worked osseous material assemblages from the Southern Levant. The focus is on how the various technologies have developed over time and how this is evident in the finished tools and objects. The results of the analyses of the worked bone assemblages from Shkarat Msaied, Beidha and Ba´ja will be discussed in relation to how knowledge, skills and traditions are transferred within the sites (working areas), as well as on a regional scale and over time.

Monica MĂRGĂRIT, Faculty of Humanities, Valahia University of Târgoviște, Romania
Pavel MIREA, County Museum of Teleorman, Romania
Valentin RADU, National Museum of Romania History, Bucharest, Romania

The exploitation of the aquatic resources for the adornments and tool manufacturing in the Neolithic settlement from Măgura "Buduiasca" ("Boldul lui Moș Ivănuș")

The settlement from Măgura "Buduiasca" ("Boldul lui Moș Ivănuș") (Teleorman County) has an important place among the Prehistoric settlements from the Romanian territory because, having a continuous inhabiting since early Neolithic,

until early Chalcolithic, it allows us to sketch the evolution (permanencies and mutations) of the utilitarian pieces and personal adornments regarding the selected raw materials and the patterns of their transformation. A first example is that of the local bivalves (*Unio* sp.), which were exploited in an opportunistic manner: in the first stage an important source of food and secondary, as a source for producing beads and utilitarian pieces, by recovering valves from domestic wastes. Another category of raw materials is that of the local gastropods shells, which don't have a nutritional value (*Lithoglyphus* sp., *Theodoxus danubialis*, *Esperiana* sp., *Ansius planorbis*). In this case we may invoke the organization of specialized expeditions, in certain periods of the year (in accordance with the specie's availability), with the purpose of gathering shells. A third category is that of the imported elements which, most likely, got to the studied community in an already finished form. They demonstrate the complex exchange networks, developed on this chronological stage. Thus, species like *Mytilus* or *Cardium*, may derive from Black Sea, while *Spondylus*, *Glycymeris*, *Ostreea* or the coral have their origins in the Mediterranean Sea. In order to have a complete picture, we need comparative studies with other contemporary or successive assemblages, based on which to be able to identify the processes of innovation and the cultural continuity, in time and space.

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Justyna ORŁOWSKA, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland

The single-row harpoons with distinguished shaft from Polish Lowland - some technological issues

The Late Glacial and early Holocene points and harpoons made of bone and antler are one of the most common finds in the southern Baltic zone. They are manifestation of well-developed hunter-gatherers economy of that time. The presented work deals with a group of characteristic harpoons which have been classified by J.G.D. Clark to type 12A. Chronologically these artefacts are connected with the Late Palaeolithic, more strictly with the tanged-point cultures. Common characteristics for this type of harpoons are: one row of strongly distinct, massive barbs, distinguished tang and wide, flat base. Selected artefacts of this type, which came from the Polish Lowland, were subjected to the technological analysis, the results of which are presented below. The microscopic analysis gave a possibility to interpret the production methods of these harpoons and allowed the identification of similarities and differences between them.

Grzegorz OSIPOWICZ, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland
Aleksandra LISOWSKA-GACZOREK, Jagiellonian University, Kraków, Poland
Daniel MAKOWIECKI, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland
Tomasz PŁOSZAJ, Medical University of Łódź, Łódź, Poland
Laurie J. REISEMA, Bioarchaeology and Biochemistry Laboratory, University of Georgia, USA
Krzysztof SZOZTEK, Institute of Zoology, Jagiellonian University, Kraków, Poland
Henryk WITAS, Medical University of Łódź, Łódź, Poland

New ornamented 'bâton percé' from central Poland. Evidence for a long-range exchange in early Mesolithic Europe?

In 2013, while digging a fish pond in small village Gołębiewo in central Poland a unique ornamented artefact made of antler was excavated. Its zoomorfic form and the type of ornamentation applied, clearly indicate its central European origin and allows to date him to early Boreal. This chronology was confirmed by 14C dating. Because of very good state of preservation it was possible to perform multi-faceted, paleobiological studies of specimen, including DNA and isotope (O, N, C) analysis. The results clearly shows that it was made from reindeer antler, animal absent in the Polish Lowlands for at least several hundred years in the moment of its production. Further analysis gave a solid base to suggestion that it lived probably in the area of Central Finland. This artefact can therefore provide the evidence for the long-range exchange in early Holocene Europe. This thesis will constitute the main idea of the presentation.

Grzegorz OSIPOWICZ, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland
Daniel MAKOWIECKI, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland
Ryszard GRYGIEL, Museum of Archaeology and Ethnography in Łódź, Łódź, Poland
Justyna KURIGA, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland

Middle Neolithic workshop producing bone chisels from site in Osłonki. Preliminary results of multi-faceted studies

The site in Osłonki is well known because of rich prehistoric material related primarily to settlement of the Late Band Pottery culture. However, it was also discovered here many sources from later phases on Neolithic, including ones connected to Funnelbeaker culture. From one of the features with this chronology comes a collection of over a dozen well-preserved bone artifacts, which can be considered as wastes from production of the large tools in a type of chisels. In presentation are discussed the preliminary results of the zooarchaeological, technological and use-wear analysis of these artefacts.

Grzegorz OSIPOWICZ, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland
Mariusz BOSIAK, Faculty of Chemistry, Nicolaus Copernicus University, Toruń, Poland
Justyna KURIGA, Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland

New studies on the Stone Age bone and antler softening methods at the Institute of Archaeology, Nicolaus Copernicus University (Poland)

The aim of this presentation is to discuss the preliminary results of the latest research on methods for softening bone and antler possibly employed in the Stone Age, conducted recently at the Nicolaus Copernicus University in Toruń. The research involved testing of 7 methods most commonly mentioned in the literature, namely, soaking in water, lactic acid, oxalic acid, urine, flax oil, lye and boiling in water. During the first experimental part of the research the softened raw materials were analysed for their workability by means of flint tools and their bending properties. In the second stage of the project the flint tools used in the experiments were subjected to use-wear analysis. As a result, wear traces typical of the specific methods were identified and characterised. These observations were used later in an analysis of prehistorical products that allowed to determine which of them might have been used in the prehistoric times. The third stage of the research covers chemical analysis of the softened bone raw materials and investigation of changes in their composition caused by the abovementioned specific softening agents. The aim was to find a chemical key that would allow identification of at least some of the covered softening techniques by means of analysing prehistoric bone and antler artefacts.

Selena VITEZOVIĆ, Institute of Archaeology, Belgrade, Serbia

To catch a fish, so juicy, sweet… Some aspects of manufacturing hooks in the Vinča culture: case study of Gomolava

The methods of fishing and hunting were seldom discussed or analysed in details; in particular, fishhooks are often considered self-explanatory (with some rare exceptions), especially among the agricultural prehistoric communities. However, there are many aspects of fishing equipment that are not sufficiently explored, in particular in the Vinča culture – raw material choices, manufacturing techniques or repair episodes. Fishhooks were quite abundant at some sites, such as eponymous Vinča-Belo Brdo, while at some sites, although also placed near large rivers rich in fish, are almost completely absent. Before addressing this important questions, in this poster will be presented several fishhooks from the site of Gomolava, that are kept in the Regional museum of Ruma. Apart from several complete fishhooks, one preform was discovered and the manufacturing techniques will be analysed.

Alexandra COMȘA, "Vasile Pârvan" Institute of Archaeology, Bucharest, Romania

A metatarsal bone of a bovid shaped as a chisel in the Eneolithic necropolis from Ostrovul Corbului (Mehedinți County, Romania)

In the proximity of the necropolis discovered at Ostrovul Corbului, in the ditch 13, few human bones and a chisel made of a bovid metatarsus had been discovered. The latter one was especially designed for being used in the right hand. For this purpose, it had a stopper, which made it uneasy to be hold in the left hand. The paper describes the discovery conditions, the implement proper and looks also for analogies.

Hristina PAVKOVA, St. Cyril and St. Methodius University of Veliko Tarnovo, Bulgaria
Petar ZIDAROV, Laboratory of Archaeometry and Experimental Archaeology, New Bulgarian University, Sofia, Bulgaria

Making holes: techniques for perforating heavy duty antler tools in the Eastern Balkans during the Copper Age

The perforated heavy-duty antler tools appear almost simultaneously or slightly pre-date the appearance of stone shaft hole axes during the Fifth mill. BC in the Eastern Balkans. Some of the earliest are typically found in richly furnished graves, possibly

as symbols of power, while later most are found simply scattered among settlement debris. One poorly understood aspect, however, concerns the variety of techniques used for perforating the shafting hole and the internal chronology of their development. We are going to sum up the evidence based on observation of archaeological finds and the results of an experimental program.

Lenka JURKOVIČOVÁ, Faculty of Science, Masaryk University, Brno, Czech Republic
Sandra SÁZELOVÁ, Faculty of Science, Masaryk University, Brno, Czech Republic
Bibiána HROMADOVÁ, Institute of Archaeology, Slovak Academy of Sciences, Nitra, Slovak Republic

The human-animals relationship in bones: analysis of cut-marks from Early Bronze Age site Pasohlávky (Czech Republic)

Human traces left on animal bones are commonly found at archeological sites and referred to the processes of animal body exploitation, such as killing, skinning, dismembering and filleting. The macroscopic and microscopic analysis of such traces (in our case cut-marks) based on certain differences within their morphological structure might help in material determination of artefact used in the butchering process. Moreover, discussion concerning material preference or stone/ metal substitution in butchering tool production dated to Bronze Age in Czech Republic might be supported with such osteological evidence. This study aims to describe cut-marks recorded in archeozoological material from the Pasohlávky site (South Moravia region, Czech Republic) dated to the Early Bronze Age period. Firstly, the replicas of six stone artefacts (unretouched blade, flake, retouched blade, and three types of saw-like blades with different barb widths) discovered at this site, together with knife replica made from bronze were produced, and also one modern steel knife was included for comparison. Secondly, the experimental cutting was designed within four different types of tissues – green bone, fibrous tissues, flesh and roasted fleshed bone; altogether 16 metapodials and 7 ribs of domestic pig (Sus scrofa f.domestica) were used in this experiment. In total, 96 cuts containing triple repetition of individual cuts with straight perpendicular trajectory oriented to the long axis of bone and in the 90° angle were performed by the right-handed experimenter.
Based on the results we can suppose that a) the characteristics of cut-marks display evidence of differences in between individual material used in tool production, b) the condition of bone and the presence of soft tissues leads to differences in cutting process obtaining the variable depth and structure of cut-mark. On the basis of this methodology and comparison with archeozoological material the study expresses enough efficiency in examination of butchering artefacts and traces left on bones.

The results could be applied in the following studies within the context of Early Bronze Age South-Moravian sites and the next research will be performed.

Corneliu BELDIMAN, Faculty of History, "Dimitrie Cantemir" Christian University, Bucharest, Romania
Diana-Maria SZTANCS, Central High School, Bucharest, Romania
Berecki SÁNDOR, Mureş County Museum, Târgu Mureş, Romania

Bronze Age adornment made of human tooth discovered in Transylvania

The rescue archaeological excavations carried out by the Mureş County Museum in 2009 within the Bronze Age site and necropolis at Luduş-Fabrica de Cânepă (Hemp Factory) led to the recovery of some interesting artefacts. Among these, there is a rare adornment/amulet made of a human canine with perforated root. Infortunately, it is fragmentary preserved – the mesio-proximal part of the root. It comes from the cremation grave no. 9 where an *Infans* II was buried (10-11 years old child) dated from Wietenberg culture, the 3rd phase (or transition from the 2nd to the 3rd). The grave had as inventory a pot with a large belly and as a lid, a S profile cup.
The adornment/amulet is a fragment of a permanent right upper canine (13). Dimensions: L 13.11. The preservation status is poor being distorted by burning.
The hanging system is a perforation with a diameter of 2.5 mm performed in medio-distal direction, placed at the proximal part at a 5.25 mm distance of the actual proximal end (apex). The perforation has symmetrical oval shape, with the long axis overlapping the axis of the piece, smooth edges, and slightly oblique walls.
The perforation was done without a special preparation of the surface, using a metal (probably bronze) point of a knife by alternative rotation. After being done on one side, the perforation reached the cavity and was done the same on the other side. The thickness of the root is 2.80-3.35 mm.
The use-wear traces are bluntness of the perforation edges on the upper side of the piece (the proximal one) and on the lateral ones.
Way of hanging/type of object: adornment, probably axially hanged as a unique element (pendant or bead) worn at the neck level. It also could have been used hanged at the wrist. It seems probably that the object was not sewn. There is no evidence regarding its usage with other hanging elements.
The issue that we arise regards the fact that is this piece a special element of funerary inventory or the piece was worn before the funerary event.

The use-wear analysis revealed that the piece was worn before the funerary event, probably by a first possessor who offered the adornment to the child during his life or it was a funerary offering to the child.

Neculai BOLOHAN, Faculty of History, "Alexandru Ioan Cuza" University of Iași, Romania
Andreea VORNICU, County History Museum of Botoșani, Romania
Luminița BEJENARU, Department of Anthropological Research, Romanian Academy, Iași Branch, Romania

Bones, tools and some other stories about recent archaeological survey in Eastern Romania

An archaeological context or an artefact can help in defining a prehistoric sequence. Thus, besides the ash-pits (zolniki), the scarcity of the pottery typology, the Late Bronze Age from the east of the Carpathians is defined by the multitude set of artefacts made of animal bones. Among them stands out by the number and the variety of the interpretations concerning the usefulness the serrated scapula, the bone sickles (tupik) or the skates. In some very recent archaeological field trip we found many ash-pits containing different amounts of bone remains with traces of processing. Through merging different types of information, coming out from Geology, Soil science, Archeology, Archaeozoology, we managed to set up some inferences regarding the use of the landscape and about technological choices used in manufacturing artefacts of hard animal materials.

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Jesus TAPIA, Sociedad de Ciencias Aranzadi, Donostia-San Sebastián, Spain
Esteban ÁLVAREZ-FERNÁNDEZ, Facultad de Geografía e Historia, Universidad de Salamanca, Spain
Rodrigo PORTERO, Facultad de Geografía e Historia, Universidad de Salamanca, Spain
José SASTRE, Asociación Científico-Cultural Zamora Protohistórica, Spain
Patricia FUENTES, Asociación Científico-Cultural Zamora Protohistórica, Spain

Bone industry during the Late Antiquity in Northern Spain: the Castro of El Castrillon (Santa Eulalia de Tábara, Zamora)

The fortified settlement of El Castillón (Santa Eulalia de Tábara, province of Zamora) is located in the middle course of the River Esla, on the historical frontier between the Swabian and Visigothic kingdoms. It controlled the whole valley and was directly related with the iron ore mines in Sierra de la Culebra. Different areas have been identified inside it, both dwellings and functional (metal-working area and storage area) spaces, dated in the late fifth and early sixth centuries AD. This report represents the study of faunal remains with human modifications found in the different areas at the site. Bone and antler are used as raw material to elaborate, for example, ornaments, handles of metal tools and anvils used for sharpening serrated, metal sickles.

Dan ELEFTERESCU, Museum of Lower Danube, Călărași, Romania

The Sewing Needles from Durostorum (*Ferma 4-Ostrovit*)

The aim of this paper is to present, for the first time, a typology of the sewing needles found in this settlement. I believe it is a simple typology, resistant to subsequent discoveries and is based on a large number (192) of finds.
To achieve this typology, I took into considerations several features, as the execution technique and the final shape of the object, noting the execution technique of the ears with *A*, the shape of the head with *B*, the shape of the body with *C*, and the presence or absence of the secondary ear with *D*.

Hasret GARAN, Department of Classical Archaeology, Istanbul University, Turkey

Bone Workshop and Artefacts in Perge

One of the most impressive ruins of Pamphylian Coast in Southern Turkey, are at the antique city of Perge, about 18 km east of Antalya. The excavations were began and carried by the scholars of the Istanbul University between 1946 and 2011, and now continuing by the archaeologists of the Museum of Antalya.
The paper focuses on the presence of numerous bone material found in Western Necropolis of Perge between 2006 and 2010 excavations, brings out the problem whether or not there was an atelier. The question of a bone atelier in Perge is answered by making comparision between the cities which certainly had the ateliers. Additionally, bone artifacts which have been reviewed through their majority and functionality between 1946-2011 will also be presented.

George NUȚU, Eco-Museum Research Institute, Tulcea, Romania
Simina RAFAILĂ-STANC, "Alexandru Ioan Cuza" University of Iași, Romania

Worked Bone and Antler from Halmyris. An Insight on Everyday Life of a Frontier Post of Later Scythia Province

Halmyris is a settlement placed near the mouths of the Danube having a long life spam, from early Roman period to early Byzantine (roughly late 1st – early 7th century AD). Previously, the site was inhabited by the Getae and, based on some pottery shards, was a Hellenistic emporion. Archaeological research on-going from early ’80 uncovered a large number of finds, but, overall, the number of carved bone and antler artefacts is rather small. Yet, a certain variety might be seen among the finds, including combs, hairpins, buckles and other implements of everyday use.
Furthermore, an epigraphic document discovered in 1991 (first two fragments) and in 1994 (the third fragment) is the single attesting of the local bone artistry. This document (a fragmentary tile) is in fact an epistula commendaticia written in the raw fabric and sends on behalf of Valerius Valerinus Constans of Legio I Iovia, to his comrade Hermes recommending him a certain Secundus. On the obverse, probably the same personage, urges Valeria of Diocletianus "the one who process the bone objects to give something to the one who is perforating the bones".
Based on the combined evidences, of artefacts and the epigraphic document, we may assume a local workshop at Halmyris and one of the rare evidences of the so-called "châne opératoire" in a military milieu, so hard to find in this part of the Late Roman Empire.
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Scientific Research and Innovation, CNCS – UEFISCDI, project number PN-II-RU-TE-2014-4-2563.

Natacha BUC, Instituto Nacional de Antropología y Pensamiento Latinoamericano – CONICET, Ciudad de Buenos Aires, Argentina
Maria Laura LOPEZ, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata – CONICET, La Plata, Argentina
Metías MEDINA, Centro de Estudios Históricos "Prof. Carlos S.A. Segreti" – CONICET, Córdoba, Argentina

Use-wear and residue analysis of a late prehispanic notched bone tool from Boyo Paso 2 (Sierras de Córdoba, Argentina)

The aim of the article is to provide a full morphological, use-wear and residue description of a notched and serrated working edge bone tool made of large-mammal scapula recovered at Boyo Paso 2 site (Sierras of Córdoba, Argentina). The bone tool came from an open-air archaeological site associated with post-molds, cultigens, wild tree-fruits, lithic artefacts, large quantities of potsherds and three radiocarbon dates of 750 ± 70 BP, 1060 ± 50 BP and 1500 ± 80 years BP.
The anatomical and taxonomic identification was made based on ungulate reference collections. Morphological, physic and metrical analysis were developed in order to identify the functionality and manufacture process of the bone tool. The use-wear pattern and food residues (starch grains and phytoliths) present on the active edge were also described.
The results show that the body part selected to achieve the tool was a camelid scapula. Microscopically visible traces and botanical residues analysis confirm that it was used to process tubers. The data provides several lights regarding the daily use of bone tools and the activities performed in the site by people with a mixed foraging and horticulturalist economy. Therefore, this study enabled exploration of a rarely preserved and largely relegated component of material culture.

Ludmila BACUMENCO-PÎRNĂU, Institute of Cultural Heritage, Academy of Sciences of Moldova, Chișinău, Republic of Moldova
Luminița BEJENARU, "Alexandru Ioan Cuza" University of Iași, Romania

Bone and antler artefacts in the medieval cities of Moldova. Case study: Old Orhei (Republic of Moldova)

The present paper includes certain results of the research aspects of the problem of

using bone and antler objects by inhabitants of Moldavia in the Middle Ages, taking as a case study sample parts discovered in the medieval site from Old Orhei (Republic of Moldavia). Numerous artefacts have been identified in different stages of manufacturing and also artefacts having different wear levels. Our study emphasizes an important diversity in the typology of artefacts and also in the anatomical and taxonomical selection of raw materials. Continue the systematic analysis of these types of objects that began a decade ago, when it was investigated batch of materials antler artefacts recovered from archaeological excavations conducted in Old Orhei during the years 1996-2001. Rich collection of objects of bone and antler, gained in the last six decades, illustrating the different segments of daily life, representing valuable testimonies of urban material civilization of this period.

Angela FUGGI, Aix-Marseille Université, Aix-en-Provence, France
Beatriz PINO URIA, Museo Nazionale Preistorico Etnografico "L. Pigorini", Rome, Italy
Pierre MAGNIEZ, Aix-Marseille Université, Aix-en-Provence, France
Antonio TAGLIACOZZO, Museo Nazionale Preistorico Etnografico "L. Pigorini", Rome, Italy

Red deer exploitation strategies during ancient Neolithic in central Adriatic Italy: the case of Colle Santo Stefano (AQ)

Colle Santo Stefano, situated on the shores of the Fucino paleolake, has provided an exceptionally rich hard animal material industry belonging to the oldest phase of Neolithic in central-east Italy, at ca. 5800 cal BC. Faunal remains attest an economy predominantly addressed toward the exploitation of caprines, but also of cattle and pig. Hunting activities integrated the economy providing complementary resources: wild boars, red deer as well as roe deer, chamois and other small carnivores.
An interdisciplinary approach, integrating technological and archaeozoological data, has been conducted on the exploitation strategies of red deer, enriching our knowledge about its role in the first Neolithic groups. The analysis has taken into account animal acquisition and exploitation strategies, allowing verifying the possible interdependence between the alimentary and technical spheres for the tools manufacturing.
The technological analysis has been carried out taking into account all the products of the chaînes opératoires: blanks, wastes and finished products. Although their modest amount, their presence at Colle Santo Stefano con_rms that at least part of the equipment had been manufactured in situ, providing essential information to the reconstruction of the techno-economic sequence.

Andreea VORNICU, County History Museum of Botoșani, Romania

Bone industries in Eastern Carpathian region at the transition from Neolithic to Chalcolithic

The paper brings into focus the issue of continuity and rupture in technological traditions in the manufacturing of bone implements at the transition from Neolithic to Chalcolithic in the eastern part of Romania. Several collections of bone implements from Precucuteni and Cucuteni cultures were studied in terms of raw material exploitation, manufacturing techniques and methods. Thus, it became obvious the existence of different traditions in the process of bone manufacturing, discernible both in the schemas of manufacturing and in the morphology of the finished objects. Moreover, the collections from Precucuteni culture show technological standardization and a small variety of types of objects, while the bone industries from Cucuteni are diversified both technologically and morphologically.

Isabelle SIDÉRA, CNRS, Maison Archéologie & Ethnologie, Nanterre, France
Andreea VORNICU, County History Museum of Botoșani, Romania
Luminița BEJENARU, Institute of Archaeology, Romanian Academy – Iași Branch, Romania

Playing with knucklebones in the Prehistoric Balkans

The paper brings together data on several collections of knucklebones from Late Neolithic – Early Chalcolithic sites from Romania and Bulgaria. The use-wear analysis together with the study of technological modifications, the observations on the context of discovery and the historical analogies allow us to consider that the studied knucklebones were used as game pieces. Hundreds of pieces are now documented, which permits such hypothesis. What implication does game have in the society? Why do people play? Why does game appear at the end of Neolithic? These are the main questions which we will address and try to address through this paper.
Acknowledgement: This research is financed by a grant of the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-II-ID-PCE-2011-3-0885.

Senica ȚURCANU, Moldavia's History Museum, "Moldova" National Museum Complex of Iași, Romania
Andreea VORNICU, County History Museum of Botoșani, Romania

The manufacturing of adornments from freshwater shells in the East Carpathian Chalcolithic

Within the Chalcolithic sites from the East Carpathian region (Cucuteni culture), shells of the *Unio* species are often found among kitchen debris. In some cases, they became raw material for the manufacturing of adornments. Though the findings representing this particular category of objects were often reported in publications, they have not become yet the subject of a detailed study.
Our paper brings together the data obtained through the analysis of several adornment items made of freshwater shells discovered in sites of Cucuteni A culture and focuses on the manufacturing process of these objects. Two different technological conceptions regarding the processing of shells were observed. The first one implies a simple manufacturing schema in which the shell's natural morphology is maintained. Only the drilling techniques differ from case to case: abrasion, rotation, and linear percussion. The second schema is much more elaborated resulting in the complete transformation of the shell's natural shape. The finished objects are circular beads, which represent, at the same time, the most frequent category of adornments made of freshwater shells. The presence within the assemblage of both finished objects and preforms allowed us the identification of each technological sequence within the manufacturing process.
Acknowledgement: This research is financed by a grant of the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-II-ID-PCE-2011-3-0885.

Petar ZIDAROV, Laboratory of Archaeometry and Experimental Archaeology, New Bulgarian University, Sofia, Bulgaria

Perforates antler "bâtons" from the Copper Age in the Eastern Balkans

The presentation provides a generalized assessment of peculiar type of antler objects with relatively limited chronological development, restricted to the third quarter of the Fifth millennium BC in the Eastern Balkans and distributed from the Aegean coast to the Lower Danube. These objects bear certain similarity to the Upper Paleolithic "bâtons" and probably likewise had combined utilitarian and symbolical significance yet in different cultural background. Series of such objects from Bulgaria and

Romania documenting various stages of their life cycle are used for reconstructing their manufacturing technology and use patterns.

Valentin RADU, National Museum of Romania History, Bucharest, Romania
Monica MĂRGĂRIT, Faculty of Humanities, Valahia University of Târgoviște, Romania
Cătălin LAZĂR, National Museum of Romania History, Bucharest, Romania

Evidence of production and use of *Lithoglyphys naticoides* beads in the Holocene from Europe: the case of Sultana-Malul Roșu site (Romania)

The aim of this research is to discuss the symbolism to which were associated the perforated shells of *Lithoglyphus* sp., inside the Gumelnița settlement from Sultana-Malu Roșu (Romania). The interrogations are not random because we can establish a quite clear demarcation between the personal adornments which constitute in a funerary inventory and those present in the settlement. Thus, in the first category, we can include especially objects made of exotic materials (*Spondylus, Dentalium,* marble*,* malachite), obtained through exchange networks while in the settlement are present fundamentally different forms, made out of local raw materials. The only type of identified personal adornment, both in the settlement and in the necropolis, is represented by the perforated shell of *Lithoglyphus naticoides*, being able to play, in this context, the intermediary role between the world of the living and that of the dead. In order to evaluate the costs invested in the manufacturing of these pieces, from the gathering of shells, to their transformation in adornments and afterwards their resilience in time, we developed an experimental program, through which to register all the implicated variables (technological gestures, necessary time for each operation, tools used, then the manner in which the usage evolved, types of fracture, etc.).

This work was performed through the Partnerships in Priority Areas Program - PN II, developed with the support of MEN – UEFISCDI, project no. PN-II-PT-PCCA-2013-4-2302.

Douglas V. CAMPANA, Pennington, USA
Pam J. CRABTREE, Department of Anthropology, New York University, USA

Worked Bone Objects from the Chalcolithic Levels of Çiftlik/Tepecik, Southern Cappadocia, Turkey

Çiftlik/Tepecik is a multi-period (Aceramic Neolithic, Ceramic Neolitic, and Chalcolithic) site located in southern Cappadocia, Turkey. The site has been

excavated for the past 15 years under the direction of Professor Ernan Biçakçi of Istanbul University. We joined the project crew in 2014, and we have concentrated our research on the worked bone objects and unmodified fauna from the Chalcolithic features, focusing on the material that was excaveted during the 2013 season. This presentation will document the traces of manufacture use wear on the 2013 bone tool assemblage. We will also examine the animal species and body parts used for bone tools and worked bone objects and compare these to the overall Chalcolithic fauna assemblage.

Alice M. CHOYKE, Medieval Studies Department, Central European University, Budapest, Hungary

Bell-Beaker Folk along the Danube: Their Osseous Technology

It is generally acknowledged that the Bell-Beaker phenomenon represents a package of easily recognizable objects connected both to movement of actual people as well as spread of know how. The direction of that movement remains unclear. Thus, wherever bell-beakers appear one finds technological traits such as the 'button-beads' with V-form attachments in a variety of materials and stone 'wrist guards as well as objects such as thong-smoothers which are generally found in this Early Bronze Age period from Kazakhstan to Central Europe. The Bell-Beaker group arrived from the west to the territory of modern Hungary around 2500 BC. They disappeared around 2100 BC, perhaps absorbed in to other local Early Bronze Age populations. These Bell-Beakers settled in small villages along the banks of the Danube River in an area around the capital city of Budapest. A series of excavations by a team from the Budapest History Museum have brought to light worked osseous assemblages from a number of settlements and cemeteries. Here, the preliminary results from materials from one of the major excavations at the site of Albertfalva-Öskor will be described and analzyed within the context of the very sparse bone tool materials from other small contemporary Early Bronze Age assemblages from the Carpathian Basin.

Workshop: bone preparation for manufacturing

Proposal: **Paul STOKES**, St. Cuthbert's Society University of Durham, Durham, UK

Nobody has yet on this discussion made any comment on obtaining and the hazards of working with any fresh material.

1. One of the first considerations must be what did the animal die of:-Old age, butchered for food, accident and worse did it die from any disease especially any zoonosis.

2. Working with fresh bones can be dangerous because the bones are very slippery, the periosteum and the natural fats can cause hands and/or cutting implements to slip (something I know to my cost have a scared left hand when I had to butcher animals whilst in the catering industry).
3. Local regulations on disposal of the waste, especially when cutting up whole animals.
4. Where can bone be obtained? Some cattle, sheep and pig bones can be obtained from the butcher but you might not be able to get all the bones you might require because some bones are not removed from joints e.g. the tibia in a leg of mutton/lamb, there are a vast number of regional differences in cutting a carcass or some come under the heading of specified meaning these are sent for incineration they and some other bones e.g. metapodials, of cattle & sheep are removed in the slaughter house. It's always worth contacting the local knacker yard especially for horse bones. Road kills for small animals, remote places where an animal died in bad weather/old age normally sheep and deer. The coast for sea birds and mammals.

Xenia POP, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
Florin GOGÂLTAN, Institute of Archaeology and Art History of the Romanian Academy,Cluj-Napoca, Romania

Primary analysis of the artefacts made from hard animal materials from Pecica-"Santul Mare/Nagysánc" Bronze Age site

Pecica-"Santul Mare/Nagysánc" settlement can be considered one of the most important Bronze Age settlement from the entire Carpathian Basin. The site is represented by a fortificated settlement – tell type, situated 6.5 km west-southwest from the actual city of Pecica (Arad County, Romania).
First archaeological investigations started in the late 19th century by László Dömötör and continued under the coordination of Márton Roska during the period of 1910-1911/1923-1924. The research was discontinued later, with some periods of short investigations dating back to 2014.
The investigated material originates from the first period of archaeological investigation (1989, 1900 and 1901) and consist of antler and bone artefacts made from cervid, bovid and deer origin-materials. The material comprises both finished materials and semifinished pieces. Most of the artefacts were hoes made out of antler extremities, but other types of tools could be identified: awls, piercing tools or even flutes. Along the crafted fragments, several other bone pieces were identified:

crania, mandibles from canids, small and large ruminants or suid bones as well as cornual processes or antlers originating from large ruminants or cervids.
The present paper attempts a description of these artefacts from an utilitarian and technological perspective.

Manuel ALTAMIRANO GARCIA, Ucoidiomas. University of Córdoba, Córdoba, Spain
Eva ALARCÓN GARCIA, Department of Prehistory and Archaeology, University of Granada, Granada, Spain

Bone tools for the deceased. Approaches to the worked osseous assemblage from the funerary Bronze Age cave of Biniadris (Menorca, Spain)

Around 3000 years ago, very quite extraordinary funerary practices and rituals were carried out at Biniadris Cave, located on the side of a cliff face on the island of Menorca (Spain). Both women and men of different ages were buried inside this natural cavern measuring approximately 10m2. Thanks to the initial fieldwork carried out during 2014, not only human bones have come to light, but also a wide range of personal objects that were part of personal objects and their clothing. At present, among them, mention must be made of an assemblage of 11 V-perforated buttons, at least 10 of which are made from bone and at least one from wild boar tusk. All these items display a great uniformity in their morphology, although there is no standardization regarding the width and placement of the perforations. Once the microscopic analysis was undertaken, a long-term and personal use of these objects was noted, which were probably used as dress accesories during the funeral ritual itself. Furthermore, the use of cinnabar as decoration has been observed and covers most of the surface of these buttons.

Kinga WINNICKA, Institute of Archaeology, University of Wroclaw, Wroclaw, Poland

Epi-Corded Ware objects of personal use made of bone: their materiality and meaning - a project overview

The project I would like to present here aims to contribute to the study of different aspects of life in past societies by analysing objects of personal use (such as adornments, dress elements and everyday small tools), made of animal hard materials and coming from sepulchral context (two Early Bronze Age cemeteries in SE Poland). Theoretical framework – anthropology of materiality, which explores the human-object relationship is combined with archaeometric approach – mainly

microwear and residue analyses, employing techniques adapted from natural sciences (notably conventional light microscopy), complemented by contextual, experimental and comparative studies. An important part of this project aims to highlight the animal-object-human interconnection by addressing the use of animal hard materials – their selection and significance for the manufacture of objects of personal use.

The project also intends to test the hypothesis that often disregarded small and heavily eroded artefacts made of osseous materials can prove useful for decoding the past when analysed using non-destructive and low-invasive techniques. This comprehensive interdisciplinary methodology applied to the study of several categories of bone artefacts (mainly beads, bead separators, pendants, pins/needles and awls, decorative plaques and tool hafts) coming from two Early Bronze Age epi-Corded Ware sites in SE Poland will provide insights into the technology and economy of these past societies, and also illuminate more intangible problems, such as identity, social roles, beliefs and symbolism in times of transition, making a connection with real people and broadening our understanding of the past.

Corneliu BELDIMAN, Faculty of History, "Dimitrie Cantemir" Christian University, Bucharest, Romania
Diana-Maria SZTANCS, Central High School, Bucharest, Romania
Berecki SÁNDOR, Mureş County Museum, Târgu Mureş, Romania
Costel ILIE, "Paul Păltănea" History Museum Galaţi, Galați, Romania

Bronze Age artefacts made of animal shoulder blades. Methodological issues of technological study

The issue regarding the animal notched scapulas are related to the Bronze Age realities within the actual space of Romania (Tei, Wietenberg and Noua cultures, the XVIth – the XIIth centuries BC). Until now, this subject generated a large bibliography in the domain despite the fact that the large assemblages have not been studied in a systematic manner, with the use of a detailed methodology. As it is known, these pieces are still the subject of debates regarding their usage.

The paper presents the data issued from the analysis regarding a collection comprising 5 artefacts made of cattle and horse shoulder blades recently recovered from two Romanian archaeological sites: Negrileşti, Galaţi County (2) and Luduş, Mureş County (3) belonging to the Wietenberg and Noua Culture (Late Bronze Age).

The technical data were obtained during a detailed microscopic analysis and a use-wear one. Their exhaustive and systematic study allows us to formulate hypotheses regarding the major aspects concerning the manufacture and use of Bronze Age notched scapulas.

All the pieces' parameters were taken in consideration and this allowed the initiation of a database containing osseous materials industry including this type of artefacts. Our approach facilitated the highlight of some characteristic elements of the technological environment in which the artefacts were used (and probably, manufactured, too).
The pieces were manufactured by applying the following procedures: fracturing, notching by knife or saw. The use of notched scapulas as tools (scrapers) for hide processing is documented by analysis of use wear traces.
The pieces were produced within the site during some household activities. They were done and used probably by women in order to process the raw materials locally procured by the species bred and slaughter with feeding purposes or which accidently died (cattle, horse, pig, sheep/goat). The observations mentioned above regarding the notched scapulas prove that household activities of osseous materials and hides working were practiced within the site.
Morphology of use-wear traces which are specific for notched scapulas brings arguments regarding the functional role related to hides processing. These artefacts are examples for a modality of using the anatomical morphology of skeletal elements in technical purposes. The morphology and the dimensions of the distal part of scapula and its distal end (thick and convex edges of the glenoid cavity) are the most appropriate in order to create artefacts that could have been hold. The horse hooves are other anatomical pieces which preserved the same concave edges and they were used in same purpose as scapulas.
The analysis of the notched shoulder blades from Negrileşti and Luduş offered us the opportunity to apply and fill in a coherent analysis framework for this type of controversial pieces. It gathers the significant quantifying both anatomical and morpho-technological data.
The methodological framework created and proposed can be extended to large collections of artefacts that offer an increased technological expressivity and more solid conclusions.

Selena VITEZOVIĆ, Institute of Archaeology, Belgrade, Serbia
Jovan MITROVIĆ, National Museum, Belgrade, Serbia

Antler technology in the Bronze Age: The case study of Zók

Antler industry was relatively rich in the Carpathian basin during the Bronze Age, as demonstrated by numerous assemblages published so far; some just as catalogue and illustration of nice objects, while some were carefully analysed from the technological and typological viewpoint.

The site of Zók, in present-day Hungary (Baranya County) offers some additional data on the technology of antler manufacture. The site was excavated in the early 20th century (after WWI) and finds are mostly from Baden Culture of the LCA settlement and from Vučedol- Zók Culture of the EBA settlement.
Rich material collected from these excavations is today stored in the National Museum in Belgrade, including approximately 150 osseous artefacts. The collection includes axes, hammers, as well as manufacture debris, that helped in reconstruction of *chaîne opératoire.* Unfortunately, the scarce data on the context do not allow reconstruction of possible workshop or working area at the site.

Marta BLASCO-MARTÍN, Universitat de València, Spain
Consuelo MATA-PARREÑO, Universitat de València, Spain
Lucía SORIA-COMBADIERA, Universidad de Castilla-La Mancha, Spain
Mercedes FUENTES-ALBERO, Universitat de València, Spain
Eva COLLADO-MATAIX, Universitat de València, Spain
Ignacio FUERTES-CABO, Universitat de València, Spain

Raw material, gestures, objects. An approach to the work of bone and ivory in the Iron Age in the Iberian Peninsula

This communication seeks to give visibility to the objects made of bone, antler and ivory in the Iron Age in the Iberian Peninsula, and it is framed within the work carried out under the project "Wood, Bone, Ivory, Antler and Shell. Marginal Crafts or Marginalized? (HUM2013-45770-P)".
Specifically, this study has focused on the industry of hard materials with animal origin that are documented in the Iberian culture. This culture is developed in a region stretching from the Bajo Guadalquivir (Andalusia, Spain), extending along the Mediterranean coast of the Iberian Peninsula and in some parts towards the peninsular interior, to the river Hérault (France), between the VIth – Ist Centuries BC.
In this paper we focus on the analysis of three common artifacts within the bone and ivory industry in the Iberian culture: pins, plates and combs. We have studied these objects from a technological point of view, thanks to a series of experimental work carried out in order to meet different operational chains, necessary to manufacture each one of these items and tools that could be used for this purpose. So, we searched the archaeological tool models to work bone and ivory, and whenever it has been possible, we have reproduced them. We have paid special attention to the results that may be obtained with different tools, gestures made, different time and effort employed according to the raw material, the tool made and the importance of the "hands" that lie behind the objects, thus considering the role of the craftsman who carried out each one of these works.

The questions raised in this research are: Is the manufacture of this type of pieces a specialized work, or anyone with access to the right tools could do it? Did it all depend on the raw materials employed? Were there local workshops on equipment manufacture with bone, antler and ivory? Can we speak of itinerant craftsmen who manufactured pieces of particular relevance on these commodities? What role did Trade and Exchange have spreading these parts throughout the Iberian world?
We believe that this is a necessary and interesting study that focuses on analysis of some pieces omitted by the archaeological research and, moreover, approaching its study not from a descriptive or typological point of view, but focusing on the manufacturing and operational chains processes, giving special importance to the role of the craftsmanship behind these objects. For all of this, experimentation has provided us with essential information that should be properly contrasted with the archaeological record.

Ariel SHATIL, The Hebrew University in Jerusalem, Jerusalem, Israel

The assemblage of bone artefacts from Iron Age IIa Tel Rehov - a typological and technological analysis

This presentation presents the preliminary results of my Masters degree thesis, directed by Dr. Rivka Rabinovich, on the bone objects assemblage from the site of Tel Rehov, Israel. The excavations at Tel-Rehov (1997-2007), directed by prof. Amihai Mazar, yielded a large and varied assemblage of artefacts from osseous material, dating to the Iron Age IIA period (ca. 1000-830BC). The excavations concentrated mainly on the unfortified lower city where a domestic neighborhood, cultic precinct and open industrial areas were identified by the excavators. The bone objects found at the site exhibit two separate trends of carvings: ad hoc carving of simple tools made by their users mainly from antler, sheep/goat ribs and long bones, and a more sophisticated professional carving of decorated objects, jewelry and composite tools, made mainly from large mammals' long bones, probably by professional carvers. The typological and technological analysis of the objects and their find spot in the excavation sheds new light on the organization of raw material acquisition, on the disappearance and appearance of some object types in the discussed period, and on local and regional traditions of bone carving.

Lóránt VASS, BTM Aquincum Museum, Budapest, Hungary

Bone-working in Roman Aquincum. Fashion, tradition, use. A contextual analysis of the Roman artefacts

The two Roman cities from Aquincum (the Civil and the Military Town) as well as the neighbouring settlements (Albertfalva, Víziváros) provide us with the same standard bone products as other Roman cities from all over the Roman Empire. Concerning their morphology or types, these artifacts look mostly the same as their counterparts from other Roman sites. Despite the standard character of Roman bone objects in general, are we able to identify local aspects in bone manufacturing? Is there any chance to determine tradition in manufacturing or in the use of these special artifact types? Can they be related to a specific community, workshop or social group? Is there any difference in the use or production of bone objects in different topographical units of the ancient settlements? The present paper tries to respond to these and similar questions. It also intends to offer a contextual analysis of the bone artifact material by investigating special (brooches made of bone, bone armor scales, amulets etc.) and standard object types from the perspective of their social, symbolic and economic contexts. Although a multidisciplinary analysis of the present bone material have already been published in 2012 (T. Bíró Mária – Alice M. Choyke – Vass Lóránt – Vecsey Ádám: *Aquincumi csonttárgyak. Bone Objects in Aquincum*, Budapest, 2012), due to the page limits of the volume and to new artifacts unearthed since that time, the aforementioned problems were scarcely, or at all presented.

Erik HRNČIARIK, Katedra Klasickej Archeologie, Trnavská univerzita v Trnave, Trnava, Slovakia

Barbarian bone and antler industry from Slovakia (1.-5. century AD)

Shortly after the beginning of the Christian era tribes of the Quadi and Suebi started to settle the territory of the southwestern part of present-day Slovakia. On the North of the territory continued the settlement of the previous period, so-called. Puchov culture, in the south of Eastern Slovakia mainly outlasted remnants of the Celto-dacian population and the przevorsk culture. In the end of the early Roman period and especially in its early period grow the Quadi territorium also to the North and East. In the northern and northeastern Slovakia was the Puchov culture replaced by so-called North-Carpatian group and the Southeast was settled by the Vandals.
Evidence of the bone shaping, especially on antler, has been preserved from the whole Roman period. Unlike in the Roman Empire, dominates the antler shaping (eg. In Nitra-Chrenová, Bratislava-Vajnory, etc.). It clearly illustrates the domestic production directly in the quadian settlements. But it is rather production of the

simple items used in household and for own need. Specialized workshops producing combs, juwelry or other objects from these materials has not yet been found in the territory of present-day Slovakia.
Most of the finds from the present-day Slovakia consists of the combs, the second most common group consists of the knife handles. Moreover between the other finds dominates the fabric and leather items (mostly needle-cases), jewelry (mostly pins), playing stones and parts of drinking horns.
The origin of the objects mostly consists of the households goods. There are also goods obtained by purchase, donation or brought by Germans from the campains outside of the Danubian border. There goods mostly consists of pins and some types of combs.
The paper has been written within the project VEGA (Projekt Nr. 1/0045/14).

Ayça GERÇEK, Osmaniye Korkut Ata Üniversitesi, Osmaniye, Turkey

Bone and ivory objects from Arykanda: a preliminary evaluation

In the excavations of Arykanda, a small scaled city of the Lycia region that have held on perpetually since 1971, some noteworthy and qualified artifacts dealing with the daily life were unearthed. Among them, bone and ivory objects are in a non-negligible number. Examples of these artifacts, which were made of bone and ivory for different purposes in Arykanda, constitute the main theme of this paper. When the bone and ivory objects from this ancient town are treated together with dateable artifacts from other contexts, it seems that they were used during a long period from Roman Age to Early Byzantine Period. Although similar examples were unearthed in many different ancient towns, a few number of studies on this matter make difficult to establish a certain date and an identification for these artifacts. This paper aims to contribute the dating and typology of bone and ivory finds by treating them in a proper manner.

Daniel CIUCALĂU, County History Museum of Botoșani, Romania
Andreea VORNICU, County History Museum of Botoșani, Romania

Amulets for the dead? The prismatic antler pendants from Sântana de Mureș culture

The grave goods represent a valuable source of information on the culture and beliefs of the people who lived in the Barbaricum. In the 4th century A.D., among the adornments found in the graves of Sântana de Mureș–Chernyakhov culture from the

eastern part of Romania, a new category of pendants made of antler appear. They are distinguished by their prismatic shape and the ring-and-dot ornament. Our study focuses on a particular assemblage of pendants found in women and children graves from the cemetery of Mihălășeni (Botoșani County). The microscopic examination of the technological traces found on the pendants enabled us to identify the techniques and methods of manufacturing, from blank obtaining to shaping and ornamentation. Moreover, the study of wear traces along with the available data on the archaeological context in which they were found in this area led us to the assumption that such pendants were manufactured particularly for the burial, serving as amulets for the deceased.

Marta BLASCO-MARTÍN, Universitat de València, Spain
Gilberto PÉREZ ROLDÁN, Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico
Gabriela INÉS MEJÍA APPEL, Instituto Nacional de Antropología e Historia, Mexico City, Mexico

Needles made of human bones from Xochimilco (Mexico)

Since the 12th century "chichimeca" groups began a migration to the Basin of Mexico; amongst these groups were the Xochimilca and the Aztecs, the latter established in the 14th century and founded what is nowadays Mexico City. The Aztecs developed an empire during the 15th century stretched from the Pacific Ocean to the Gulf of Mexico and so obtained numerous tributes, including captives to be sacrificed to its two main deities: Huitzilopochtli (god of war) and Tlaloc (god of water). Among the cultural practices that characterize them, is the use of bones of human bodies to make tools, ornaments and ceremonial objects.

This paper presents the study of needles made in long human bones (*Homo sapiens*) from the region of Xochimilco, now a quartier from Mexico City, that in pre-Hispanic times was one of the cities conquered by the Aztec empire. The development and use of these needles will be discussed, as well as identification of the raw material and the proposal about what people was that these bones were obtained: captivs or craftsmens' relatives?

The archaeological site of Xochimilco presents in its early stages (12th century – 15th century) stone technology and in its final stages (16th century, by the time of arrival of the Spaniard conquerors), perhaps the use of metal, so it is important to study the technology produced by these different tools. To do this, we have use experimental archeology with obsidian cutting tools and abrasives (igneous rocks), and also metal tools and other abrasives (emery). Thus, we have analyzed the use trace, the

operational chain (chaîne opératoire) and the effort and time spent with each of these techniques.

LIST OF PARTICIPANTS

Adina BORONEANȚ	"Vasile Pârvan" Institute of Archaeology, Bucharest, Romania	boro30@gmail.com
Agnes FONT	ELTE BTK Régészettudományi Intézet, Budapest, Hungary	fontagnes95@gmail.com
Aleksandra LISOWSKA-GACZOREK	Jagiellonian University, Kraków, Poland	
Alexandra COMȘA	"Vasile Pârvan" Institute of Archaeology, Bucharest, Romania	alexcomsa63@yahoo.com
Alice M. CHOYKE	Medieval Studies Department, Central European University, Budapest, Hungary	choyke@ceu.edu
Andreea VORNICU	County History Museum of Botoșani, Romania	andreeavtf@yahoo.com
Angela FUGGI	Aix-Marseille Université, Aix-en-Provence, France	angelafuggi@yahoo.it
Antonio TAGLIACOZZO	Museo Nazionale Preistorico Etnografico "L. Pigorini", Rome, Italy	antonio.tagliacozzo@beniculturali.it
Ariel SHATIL	The Hebrew University in Jerusalem, Jerusalem, Israel	ariel.shatil@mail.huji.ac.il
Ayça GERÇEK	Osmaniye Korkut Ata Üniversitesi, Osmaniye, Turkey	aycaozcan@yahoo.com
Beatriz PINO URIA	Museo Nazionale Preistorico Etnografico "L. Pigorini", Rome, Italy	pino.albertini@alice.it
Berecki SÁNDOR	Mureş County Museum, Târgu Mureş, Romania	sberecki@yahoo.com
Bibiána HROMADOVÁ	Institute of Archaeology, Slovak Academy of Sciences, Nitra, Slovak Republic	bibiana.hromadova@gmail.com
Cătălin LAZĂR	National Museum of Romania History, Bucharest, Romania	catalinlazar2014@gmail.com
Clive BONSALL	University of Edinburgh, United Kingdom	clive.bonsall@ed.ac.uk
Consuelo MATA-PARREÑO	Universitat de València, Spain	consuelo.mata@uv.es

Corneliu BELDIMAN	Faculty of History, "Dimitrie Cantemir" Christian University, Bucharest, Romania	cbeldiman58@yahoo.com
Costel ILIE	"Paul Păltănea" History Museum Galaţi, Galați, Romania	costelilie@gmail.com
Dan ELEFTERESCU	Museum of Lower Danube, Călărași, Romania	elefterescud@yahoo.com
Daniel CIUCALĂU	County History Museum of Botoșani, Romania	
Daniel MAKOWIECKI	Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland	makdan@umk.pl
Diana-Maria SZTANCS	Central High School, Bucharest, Romania	beldiana22@yahoo.com
Douglas V. CAMPANA	Pennington, USA	doug_v_c@comcast.net
Erik HRNČIARIK	Katedra Klasickej Archeologie, Trnavská univerzita v Trnave, Trnava, Slovakia	erik.hrnciarik@truni.sk
Esteban ÁLVAREZ-FERNÁNDEZ	Universidad de Salamanca, Spain	estebanalfer@hotmail.com
Eva ALARCÓN GARCIA	Department of Prehistory and Archaeology, University of Granada, Granada, Spain	eva@ugr.es
Eva COLLADO-MATAIX	Universitat de València, Spain	ecollado456@gmail.com
Éva DAVID	Laboratoire Préhistoire et Technologie, Maison Archéologie & Ethnologie, Université Paris Ouest Nanterre-La-Défense, Nanterre Cedex, France	eva.david@cnrs.fr
Farhad GULIYEV	Institute of Archaeology and Ethnography, Azerbaijan National Academy of Science	fred_amea@mail.ru
Florin GOGÂLTAN	Institute of Archaeology and Art History of the Romanian Academy,Cluj-Napoca, Romania	floringogaltan@gmail.com
Gabriela INÉS MEJÍA APPEL	Instituto Nacional de Antropología e Historia, Mexico City, Mexico	gabriela_mejia@inah.gob.mx
George NUȚU	Eco-Museum Research Institute, Tulcea, Romania	nutugrg@yahoo.com

Gilberto PÉREZ ROLDÁN	Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico	gilbertoperezroldan@yahoo.com.mx
Grzegorz OSIPOWICZ	Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland	grezegor@umk.pl
Hasret GARAN	Department of Classical Archaeology, Istanbul University, Turkey	hasrettoper@gmail.com
Henryk WITAS	Medical University of Łódź, Łódź, Poland	henryk.witas@umed.lodz.pl
Hristina PAVKOVA	St. Cyril and St. Methodius University of Veliko Tarnovo, Bulgaria	hdmarkovi@gmail.com
Ignacio FUERTES-CABO	Universitat de València, Spain	xnatxox@hotmail.com
Isabelle SIDÉRA	CNRS, Maison Archéologie & Ethnologie, Nanterre, France	isabelle.sidera@mae.u-paris10.fr
Javier ANTÓN AGUILAR	University of Cordoba, Córdoba, Spain	javianton94@hotmail.com
Jesus TAPIA	Sociedad de Ciencias Aranzadi, Donostia-San Sebastián, Spain	jtapia@aranzadi.eus
José SASTRE	Asociación Científico-Cultural Zamora Protohistórica, Spain	josesastreb@hotmail.com
Jovan MITROVIĆ	National Museum, Belgrade, Serbia	j.mitrovic@narodnimuzej.rs
Julián BÉCARES	Universidad de Salamanca, Spain	jbecares@usal.es
Justin BRADFIELD	University of the Witwatersrand, Johannesburg, South Africa	Jbradfield8@gmail.com
Justyna KURIGA	Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland	kuriga@doktorant.umk.pl
Justyna ORŁOWSKA	Institute of Archaeology, Nicolaus Copernicus University, Toruń, Poland	orlowskajustyna@wp.pl
Kinga WINNICKA	Institute of Archaeology, University of Wroclaw, Wroclaw, Poland	k.m.winnicka@gmail.com
Kristine MARTIROSYAN-OLSHANSKY	University of California, Los Angeles, USA	kristineolsh@yahoo.com
Krzysztof SZOZTEK	Institute of Zoology,	szosy@wp.pl

	Jagiellonian University, Kraków, Poland	
Laurie J. REISEMA	Bioarchaeology and Biochemistry Laboratory, University of Georgia, USA	reitsema@uga.edu
Lenka JURKOVIČOVÁ	Faculty of Science, Masaryk University, Brno, Czech Republic	376213@mail.muni.cz
Lóránt VASS	BTM Aquincum Museum, Budapest, Hungary	lorant.vass@aquincum.hu
Lucía SORIA-COMBADIERA	Universidad de Castilla-La Mancha, Spain	lucia.soria@uclm.es
Ludmila BACUMENCO-PÎRNĂU	Institute of Cultural Heritage, Academy of Sciences of Moldova, Chișinău, Republic of Moldova	ludmila.pirnau@gmail.com
Luminița BEJENARU	Romanian Academy, Iași Branch, Romania; "Alexandru Ioan Cuza" University of Iași, Romania	bejlumi@yahoo.com lumib@uaic.ro
Manuel ALTAMIRANO GARCIA	Ucoidiomas. University of Córdoba, Córdoba, Spain	maltamiranogarcia85@gmail.com
Maria Laura LOPEZ	Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata – CONICET, La Plata, Argentina	mllopezdepaoli@yahoo.com.ar
Marian CUETO	Universitat Autònoma de Barcelona, Spain	mariancuetor@gmail.com
Mariusz BOSIAK	Faculty of Chemistry, Nicolaus Copernicus University, Toruń, Poland	bosiu@chem.umk.pl
Marta BLASCO-MARTÍN	Universitat de València, Spain	marblas4@alumni.uv.es marta.blasco.martin@gmail.com
Mercedes FUENTES-ALBERO	Universitat de València, Spain	m.mercedes.fuentes@uv.es
Metías MEDINA	Centro de Estudios Históricos "Prof. Carlos S.A. Segreti" – CONICET, Córdoba, Argentina	paleomedina@yahoo.com.ar
Migdonia GEORGESCU	National Museum of Romania History, Bucharest, Romania	gmigdonia@yahoo.com
Monica MĂRGĂRIT	Faculty of Humanities, Valahia University of Târgoviște, Romania	monicamargarit@yahoo.com

Natacha BUC	Instituto Nacional de Antropología y Pensamiento Latinoamericano – CONICET, Ciudad de Buenos Aires, Argentina	natachabuc@gmail.com
Neculai BOLOHAN	Faculty of History, "Alexandru Ioan Cuza" University of Iași, Romania	neculaibolohan@yahoo.com
Ninna MANASERYAN	Scientific Center of Zoology and Hydroecology, National Academy of Sciences of the Republic of Armenia, Yerevan Republic of Armenia	ninna_man@yahoo.com
Nora YENGIBARYAN	Institute of Archaeology and Ethnography, National Academy of Sciences of the Republic of Armenia, Yerevan, Republic of Armenia	
Pam J. CRABTREE	Department of Anthropology, New York University, USA	pc4@nyu.edu
Patricia FUENTES	Asociación Científico-Cultural Zamora Protohistórica, Spain	pf_melgar@yahoo.es
Paul STOKES	St. Cuthbert's Society University of Durham, Durham, UK	escoffier1951@yahoo.co.uk
Pavel MIREA	National Museum of Romania History, Bucharest, Romania	pavelcmirea@yahoo.com
Petar ZIDAROV	Laboratory of Archaeometry and Experimental Archaeology, New Bulgarian University, Sofia, Bulgaria	petar.zidarov@gmail.com
Pia WISTOFT NIELSEN	Christian-Albrechts Universität zu Kiel, Germany; University of Copenhagen, Denmark	pianiel@gmail.com
Pierre MAGNIEZ	Aix-Marseille Université, Aix-en-Provence, France	pierre.magniez@univ-amu.fr
Rodrigo PORTERO	Facultad de Geografía e Historia, Universidad de Salamanca, Spain	rodrigoportero@hotmail.com
Ruben BADALYAN	Institute of Archaeology and Ethnography, National Academy of Sciences, Yerevan, Armenia	r.badalyan@yahoo.com

Ryszard GRYGIEL	Museum of Archaeology and Ethnography in Łódź, Łódź, Poland	muzeum@maie.lodz.pl
Saiji ARAI	University of Tokyo, Japan	araisj@outlook.com
Sandra SÁZELOVÁ	Faculty of Science, Masaryk University, Brno, Czech Republic	sazelova@sci.muni.cz
Selena VITEZOVIĆ	Institute of Archaeology, Belgrade, Serbia	selenavitezovic@gmail.com
Senica ȚURCANU	Moldavia's History Museum, "Moldova" National Museum Complex of Iași, Romania	senicat2000@yahoo.com
Simina RAFAILĂ-STANC	"Alexandru Ioan Cuza" University of Iași, Romania	simina.stanc@uaic.ro
Simone MULAZZANI	Aix-Marseille Université, Aix-en-Provence, France	simone.mulazzani@yahoo.fr
Tomasz PŁOSZAJ	Medical University of Łódź, Łódź, Poland	
Valentin RADU	National Museum of Romania History, Bucharest, Romania	raduvalentin@hotmail.com
Valentina VOINEA	National History and Archaeology Museum, Constanța, Romania	vialia_rahela@yahoo.fr
Vuk KOLDŽIĆ	Institute of Prehistoric Archaeology, Freie Universität Berlin, Germany	vuki1988@yahoo.co.uk
Xenia POP	University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania	xenia.pop@usamvcluj.ro
Yoshihiro NISHIAKI	University of Tokyo, Japan	