Experimental Archaeology Conference 2025

Date: Monday May 12th 2025 - Friday May 16th 2025

Location: The event will be located at the Federal University of Paraná, at the Juvevê Campus, Where the Center for Archaeological Studies and Research (CEPA) and the Museum of Archaeology and Ethnology (MAE) are located.

Address of the location: Rua Bom Jesus, 650. Campus Juvevê. Universidade Federal do Paraná.

Final Program

Funded by:

CAPES

CNPq
Conselho Nacional de Desenvolvimento Científico e Tecnológico

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Sessions Timetable

	Monday 12th May	Tuesday 13th May	Wednesday 14th May
8:00 - 9:00	*Registration*	Online only Session A (metalwork)	Online only Session B (public craft)
9:00 - 10:00	Practical workshops	Practical workshops / Keynote Lecture (online only)	Practical workshops
10:00 - 12:00			
12:00 - 14:00	*Lunch break*	*Lunch break*	*Lunch break*
14:00 - 15:15	Introduction / Keynote Lecture	Keynote Lecture	Session 5 (ceramics)
15:15 - 15:30		Session 3 (bone)	Session 6 (ceramics)
15:30 - 16:30	Session 1 (lithics)		
16:30 - 16:45			Session 7 (ceramics and other) & Closing
16:45 - 18:00	Session 2 (lithics + rock art)	Session 4 (bone, wood, textiles)	

All times shown are in local Brasília Time (BRT) - [UTC-3]

Workshops

Monday 12th - Wednesday 14th - Ceramics Workshop

Leader: Danilo Campos Borum-Kren (Brazil)

Danilo Campos Borum-Kren is the Cacique (leader) of an Indigenous Borum-Krem community, and has a wide range of experience in different aspects of traditional technology, including ceramics. Across the three days of the conference, participants will be able to learn about different techniques and approaches to working with ceramics.

Monday 12th - Wednesday 14th - Lithics Workshop

Leader: Prof. Dr. Hugo Nami, University of Buenos Aires (Argentina)

Prof. Nami is a specialist in the the lithic technology of South America, and is considered a pioneer of experimental archaeology in South American archaeological research. Across the three days of the conference, participants will be able to learn about different techniques and approaches to working lithics.

Monday 12th - Tuesday 13th - Bone and Antler Workshop

Leader: Dr. Matilda Siebrecht, Laboratory for Archaeological Microscopic Analysis (Germany)

Dr Siebrecht has experimental archaeological experience in organic material technologies from different cultures in the Northern hemisphere - from prehistoric Netherlands to Paleo-Inuit Arctic Canada. Across two days, participants will be welcome to try out different techniques and approaches to working bone and antler.

Wednesday 14th - Indigenous Paintings Workshop: Shapes, colors and meanings

Leader: Eldissandra Toscano de Souza, Parintintin culture (Brazil)

Eldissandra Toscana de Souza is Indigenous Parintintin with a background in prehistoric archaeology, specialising in the meaning behind shapes and colours of the past and present. On the final day of the academic conference program, participants will be able to learn about different aspects of indigenous painting techniques.

Keynote Lectures

Monday 12th - 14:15 (BRT)

Prof. Dr. Hugo Nami, from the University of Buenos Aires (Argentina)

Topic: Experimental archaeology in South America, focusing on lithic technology

Tuesday 13th - 9:00 (BRT) (online only)

Prof. Dr. Udayakumar Sankarlingam, National Institute of Advanced Studies (India)

Topic: The Importance of Experimental Archaeology and Ethnoarchaeology in Technical Studies of Material Culture: Pottery technique, Iron smelting & Bone tool making techniques

Tuesday 13th - 14:00 (BRT)

Prof. Dr. Alex Martire, from the Federal University of Rio Grande (Brazil)

Topic: The use of digital technologies for archaeological experiments

Session 1 - Lithics

Monday 12th May

15:30 - 15:45	**Techno-Experimental and Functional Approach to the Lesmas of the Itaparica Tradition (Central Brazil, Serranópolis)** *MSc. José Lucas Otero Couto[1], Dr. Antoni Palomo[1], Dr. Ignacio Clemente Conte[2], Dr. Juan José Ibáñez[2] (online presentation)*
15:45 - 16:00	**The 'coffee bean' sinkers of Late Mesolithic West Norway. Combining experiments and photogrammetric modelling to study the crafting of small soapstone artefacts.** *Mette C. Adegeest, Simon Radchenko (online presentation)*
16:00- 16:15	**Recycle your Neolithic Axe! An experimental approach to recycling in the Vlaardingen Culture (3400-2500 BCE) in the western Netherlands** *Lasse van den Dikkenberg, Diederik Pomstra, Annelou van Gijn (online presentation)*
16:15 - 16:30	Questions and discussion

Techno-Experimental and Functional Approach to the Lesmas of the Itaparica Tradition (Central Brazil, Serranópolis)

MSc. José Lucas Otero Couto[1], Dr. Antoni Palomo[1],
Dr. Ignacio Clemente Conte[2], Dr. Juan José Ibáñez[2]

[1] UAB/Universidad Autónoma de Barcelona
[2] CSIC-IMF/ Consejo Superior de Investigaciones Científicas-Institución Milá y Fontanals

This study focuses on the investigation of the Lesmas or Slugs of the Itaparica Tradition, an archaeological culture associated with the first mass migration movements in Brazil during the late Pleistocene and the Pleistocene/Holocene transition.

Our research is based on the slugs documented in the Serranópolis region, central Brazil. It aims to advance the understanding of these tools by developing the first approach to a use-wear reference collection and conducting experiments to evaluate their function in different contexts. Beyond use-wear, Aspects such as hafting, materials used, and the gestures associated with their use will be analysed.

This experimental and functional approach seeks to fill gaps in current knowledge about the Lesmas while laying a foundation for future research, ultimately contributing to the understanding of the technological and social practices of this important archaeological culture.

Este estudo investiga as Lesmas da Tradição Itaparica, uma cultura arqueológica associada aos primeiros movimentos de migração em massa no Brasil durante o final do Pleistoceno e a transição Pleistoceno/Holoceno.

Nossa pesquisa é baseada nas lesmas documentadas na região de Serranópolis, Brasil Central. Buscamos avançar o entendimento dessas ferramentas ao desenvolver a primeira abordagem para uma coleção de referência traceológica e realizar experimentos para avaliar sua função em diferentes contextos. Além da traceologia, Aspectos como encabamento, materiais utilizados e os gestos associados ao seu uso serão analisados.

Esta abordagem experimental e funcional busca preencher lacunas no conhecimento atual sobre as Lesmas enquanto estabelece uma base para pesquisas futuras, contribuindo, em última instância, para o entendimento das práticas tecnológicas e sociais desta importante cultura arqueológica.

The ‘coffee bean’ sinkers of Late Mesolithic West Norway. Combining experiments and photogrammetric modelling to study the crafting of small soapstone artefacts.

Mette C. Adegeest, Simon Radchenko

University of Stavanger

In the hunter-fisher-gatherer societies of the Norwegian Late Mesolithic and Early Neolithic, stable and abundant supplies of marine fish were a major food source and probably contributed to the development of an increasingly stable, semi-sedentary settlement system. Fishing equipment must have played an important role in these societies, but has not always received much archaeological attention. ‘Coffee bean’ sinkers have been particularly underappreciated. These small, sometimes decorated, soapstone (or soapstone-like) objects are a common find along the West-Norwegian coast and are thought to have been used in line fishing during the Late Mesolithic and possibly into the Early Neolithic. Previous studies have considered their distribution and forms, but little else. My PhD project focuses on these objects and the role they played in Late Mesolithic West-Norwegian societies, as a way of gaining new insights into a variety of interconnected Late Mesolithic developments in Norway. This paper will focus specifically on the chaîne opératoire of making these objects, presenting actualistic experiments we have carried out to investigate their production and ornamentation. The softness of the material makes these objects quick and easy to form—requiring no specialised toolkit or advanced skills—and invites ornamentation. An analysis and comparison of highly accurate and precise photogrammetric 3D models of both original artefacts and experimentally produced objects provides further details, including clues to the specific kinds of tool used to make the originals.

Keywords: Soapstone; fishing; Late Mesolithic; chaîne opératoire; experimental archaeology; traceology; photogrammetry

Recycle your Neolithic Axe! An experimental approach to recycling in the Vlaardingen Culture (3400-2500 BCE) in the western Netherlands

Lasse van den Dikkenberg, Diederik Pomstra, Annelou van Gijn

Laboratory for Material Culture Studies, Leiden University

Neolithic axes in the western Netherlands are rarely found in a complete state. Flint is scarce in the area and when axes were exhausted, or when they broke during use, they were often re-used as flake cores. Sites from the Vlaardingen Culture (3400-2500 BCE) often yield large quantities of flakes and retouched tools made from polished axe fragments. Using experimental archaeology we tried to better understand the importance of recycled flint axes in the Vlaardingen Culture period. The experiments were conducted in the archaeological open-air museum of Masamuda as part of the Putting Life into Late Neolithic Houses project. For the experiments we reconstructed four oval flint axes which were subsequently re-used as flake cores. The experiments provided valuable insights into the usefulness of broken axes as flake cores. It was further demonstrated that flakes which are struck from axes generally do not have a remnant of the polished outer surface. Therefore, the majority of axe fragments remain archaeologically invisible. This demonstrated that we have greatly underestimated the importance of the recycling of flint axes in this period. Based on the quantification of the experiments we are now able to provide estimates for the missing, or archaeologically invisible, axe fragments on Vlaardingen Culture sites. This provided new insights into the importance of recycled axes in the Vlaardingen Culture technological system.

Session 2 - Lithics and Rock Art

Monday 12th May

17:00 - 17:15	**Experimental Archaeology and Traceology in Lithic Projectile Fractures: Creating a Reference Collection with Bow and Arrow** *Rafael Antunes Novaes de Carvalho, João Carlos Moreno de Sousa*
17:15 - 17:30	***Functional Analysis and Experimental Traceology of Lithic Industries : Exploring Raw Materials from the Foz do Chapecó Archaeological Zone in the Upper Uruguay River Valley*** *Lou Igier, Antony Borel, Amélie Da Costa, Antoine Lourdeau, Marcos César Pereira Santos, Julia Cabanès, Mirian Carbonera*
17:30 - 17:45	**Experimentation with Rock Paintings: The Act of Painting** *Amanda Trindade Diniz (online presentation)*
17:45 - 18:00	Questions and discussion

Experimental Archaeology and Traceology in Lithic Projectile Fractures: Creating a Reference Collection with Bow and Arrow.

Rafael Antunes Novaes de Carvalho, João Carlos Moreno de Sousa

This study presents an experimental archaeology project aimed at producing a reference collection of impact fractures in lithic projectile points. The research focuses on the replication and controlled use of projectile points associated with the Umbu archaeological phase, specifically those excavated at the prehistoric site, known as “Abrigo Dalpiaz site” (RS-LN-1, Brazil). The primary objective is to provide comparative material for future traceology analyses, aiding in the identification of projectile use-wear patterns in archaeological contexts.

To achieve this, experimental lithic points were replicated by Professor Dr. João Carlos Moreno de Sousa, using raw materials analogous to those found at the site. Two types of projectile points were used: Polonio and Garivaldinense, crafted from dacite and silicified sandstone, respectively. Nine projectile replicas were produced and mounted on wooden shafts with natural fiber bindings. The experimental procedure involved controlled shooting of these replicas using a traditional wooden bow and modern bow at a standardized target—a recently butchered pig rib, combined with EVA foam layers to simulate soft tissue resistance. The shooting was conducted from distances of 5 and 10 meters, with systematic recording of penetration depth, fracture morphology, and projectile integrity.

The study showed the possibility of making traceology experiments (use-wear) without many resources available, giving hope for future development in this line of research at Brazil. Post-experiment analyses involved macroscopic and microscopic documentation of fracture patterns, following methodologies established in impact fracture studies. The results provided valuable qualitative data, forming a visual and descriptive database for future comparative studies. The research highlights the importance of experimental archaeology and traceology in understanding prehistoric hunting technologies and contributes to the development of these methodologies in Brazilian archaeology. The study also addresses methodological challenges and proposes refinements for future experimental protocols in projectile use-wear analysis.

This reference collection serves as an initial framework for further experimental studies and offers a foundational dataset for archaeologists investigating the functional aspects of lithic projectile technology in South America.

Functional Analysis and Experimental Traceology of Lithic Industries: Exploring Raw Materials from the Foz do Chapecó Archaeological Zone in the Upper Uruguay River Valley

Lou Igier[1], Antony Borel[12], Amélie Da Costa[3], Antoine Lourdeau[1], Marcos César Pereira Santos[4], Julia Cabanès[5], Mirian Carbonera[6]

[1] Muséum National d'Histoire Naturelle-MNHN, HNHP, France
[2] Institute of Archaeological Sciences, ELTE BTK Eötvös Loránd University, Múzeum krt. 4/B, 1088 Budapest, Hungary
[3] Maison René Ginouvès (CNRS-Université P I-Université Paris Ouest Nanterre La Défense-Ministère de la Culture), UMR 7041- ArScAn - AnTET, Service départemental d'archéologie du Val-d'Oise, France
[4] Programa de Pós-graduação ao em Antropologia da Universidade Federal de Pelotas, Brazil
[5] Institut Català de Paleoecologia Humana i Evolució Social, IPHES, Tarragona, Spain
[6] Programa de Pós-graduação

Since the initial surveys conducted in 1998, the archaeological zone of Foz do Chapecó, located in the state of Santa Catarina, has opened new perspectives on Brazilian prehistory. The discovery of numerous sites along the banks of the Uruguay River has significantly enriched our understanding of the prehistoric cultures of southern Brazil and their settlement dynamics. Within this context, the Franco-Brazilian project Peuplements préhistoriques de la haute vallée du fleuve Uruguay (POPARU) has enabled a detailed technological characterization of the lithic industries from the sites Uruguai 1 (RS-URG-01) and Linha Policial 7 (ACH-LP-07), spanning a chronological range from the Early Holocene to ceramic traditions. Despite these advancements, the functional analysis of these lithic assemblages remains underexplored, leaving key questions unanswered. The present study addresses this gap by presenting a new experimental use-wear reference framework developed from the analysis of local raw materials prevalent in the Foz do Chapecó region, including sandstone, basalt, chalcedony, and quartz, which were employed by prehistoric groups. Experimental artifacts were subjected to microscopic analyses using both optical and scanning electron microscopy to establish a robust traceological framework. These experimental datasets are subsequently applied to lithic materials recovered from levels IVc and IVd of the Uruguai 1 site, dated to approximately 8,500 cal BP and 10,500 cal BP, respectively. The results not only enhance the understanding of artifact functionality within these assemblages but also provide interpretative frameworks applicable to lithic industries across various periods of Brazilian archaeology. Furthermore, the study highlights the functional potential of enigmatic artifacts, particularly those produced through bipolar-on-anvil flaking techniques using chalcedony and quartz.

Experimentation with Rock Paintings: The Act of Painting
Experimentação com tintas rupestres: o pintar

Amanda Trindade Diniz

Universidade Federal de Minas Gerais

The indigenous rock paintings at the site named Grande Abrigo de Santana do Riacho (Minas Gerais), beyond their beauty, reveal a deep and temporally rich history in the diversity of bodies, artifacts, and knowledge (Prous, 91; 92/93). The overlapping relationships between the paints establish, in addition to the relative chronology, the different forms of composition and connection between the traces. [LP1] The theoretical-methodological discussions carried out by the team from the Archaeology sector of the Natural History Museum and Botanical Garden at UFMG have yielded interesting results through a concept of 'paint' and the composition of the figures and their distribution on the rock walls (Linke et al., 2020; Magalhães, 2021; Diniz, 2020; Baldoni, 2016; Montovanelli, 2022; Dias, 2017; Isnardis, 2004; Linke and Isnardis, 2008 and 2012; Tobias Júnior, 2010).

In this work, I intend to present the application of these concepts to archaeological experimentation, so that, through the production of paint and the exercise of painting, we can question our certainties and understand the countless decisions made in the act of painting. The focus of this work will be on the rock paintings classified as geometric and abstract, questioning the relative chronology of these images within the archaeological site and why they have been treated as older by previous research teams (Prous, 91; 92/93).

Keywords: Rock painting; Paint; Indigenous technology; Minas Gerais

As pinturas indígenas rupestres do sítio nomeado de Grande Abrigo de Santana do Riacho (Minas Gerais), para além da sua beleza, mostram uma história profunda temporalmente e muito rica na diversidade de corpos, artefatos e conhecimentos (Prous, 91; 92/93). As relações de sobreposição entre as tintas estabelecem, além da cronologia relativa, as diferentes formas de composição e conexão entre os traços.[LP1] As discussões teórico-metodológicas que vêm sendo realizadas pela equipe do setor de Arqueologia do Museu de História Natural e Jardim Botânico da UFMG, com resultados interessantes através de um conceito de “tinta” e de composição das figuras e sua distribuição nas paredes rochosas (Linke et al., 2020; Magalhães, 2021; Diniz, 2020; Baldoni, 2016; Montovanelli, 2022; Dias, 2017; Isnardis, 2004; Linke e Isnardis, 2008 e 2012; Tobias Júnior, 2010).

Neste trabalho pretendo apresentar a aplicação destes conceitos à experimentação arqueológica, para que, através da produção da tinta e o exercício de pintar, possamos questionar nossas certezas e conhecer as inúmeras decisões que se toma para a atividade do pintar. O destaque neste trabalho será dado para as pinturas rupestres classificadas enquanto geométricas e abstratas, questionando a cronologia relativa dessas imagens dentro do sítio arqueológico e o porquê de serem tratadas como mais antigas pelas equipes de pesquisa anteriores (Prous, 91; 92/93).

Keywords: Keywords: Rock painting; Paint; Indigenous technology; Minas Gerais

Session A (online only) - Metalwork

Tuesday 13th May

8:00 - 8:15	**Reconstructing the Manufacturing Process of an Early Historic Bangle from Tekttha, Naogaon, Bangladesh: An Experimental Archaeological Approach** *Abdul Mazed, Md. Masood Imran, Sabikun Naher, Bulbul Ahmed*
8:15 - 8:30	**The project "Turning Bog Ore into Gold": prospecting for local bog iron ore deposits and iron smelting experiments in Lithuania** *Andra Simniškytė-Strimaitienė*
8:30 - 8:45	**Results of ground and aeromagnetic surveys for searching for ancient metallurgical objects in the Baikal region in Russia** *D. L.A. Onamoun, S.V. Snopkov, K.M. Konstantinov, I.O. Konshin, I.V. Lobuov*
8:45 - 9:00	Questions and discussion

Reconstructing the Manufacturing Process of an Early Historic Bangle from Tekttha, Naogaon, Bangladesh: An Experimental Archaeological Approach

Abdul Mazed, Md. Masood Imran, Sabikun Naher, Bulbul Ahmed

Department of Archaeology, Jahangirnagar University

Copper and copper alloy ornaments have a long tradition in human history. These ornaments often symbolize social status, identity, and the remarkable skill of artisans. In addition, their manufacturing process marked technological progress and cultural expression. Since early historic periods, copper objects, including copper bangles, have been unearthed across the various sites in ancient Bengal, including modern-day Eastern India and Bangladesh, such as Senuwar and Chirand in Bihar; Golabai Sasan, Sankerjang, and Chandrasagarnala in Odisha; Baneshwardanga in West Bengal; and Mahasthangarh, Wari-Bateshwar, and Tekttha in Bangladesh. Although a few works on traditional metalworking have already been done, there is no work on the ancient ornament-making process of these sites. In this context the present study intends to understand the manufacturing process of a copper bangle from a recently discovered early historic site, Tekttha, Naogaon, Bangladesh, through an experimental archaeological approach.

The studied copper bangle is made of two parts attached with a pair of hinges and highly ornamented. Unfortunately, a small portion of the bangle is missing. The first recovered portion has a length of 50.8 mm, while the second part measures 54.2 mm. Elemental composition and physical properties of this bangle were investigated using X-ray fluorescence (XRF) and scanning electron microscopy (SEM) to assess their material properties. Additionally, experimental replication of this ancient bangle was done with the help of a group of artisans of Vakurta, a village near Savar, Dhaka, popularly known as a Gahaona Gram for their traditional copper alloy ornament-making processes. This approach ensured historical correctness in terms of material, technique, and skill. However, the elemental investigation shows that the bangle is mostly made of copper, zinc, nickel, and trace amounts of other metals, while the SEM micrograph indicates that the bangles were probably made by casting rather than hammering. The porosity or certain dark patches could indicate casting flaws like segregation or micro-voids. The casting hypothesis is further supported by the overall grain structure, which seems to be fairly equiaxed. Additionally, the bangle's composition and microstructure were quite similar to the original artifacts when it was experimentally recreated using the traditional

methods of Vakurta artisans, indicating that manufacturing skills had remained consistent throughout time. This study advances our knowledge of early historic craftsmanship and underlines its value in the broader cultural history of Bangladesh. Additionally, it showcases the enduring skills of Vakurta artisans, maintaining ancient jewelry-making techniques and exposing their cultural legacy to the worldwide audience.

Keywords: Copper Bangle, Ancient Ornament-manufacturing Process, Experimental Archaeology, Early Historic Period, Tekttha, Bangladesh.

The project "Turning Bog Ore into Gold": prospecting for local bog iron ore deposits and iron smelting experiments in Lithuania

Andra Simniškytė-Strimaitienė

Institute of Lithuanian History

Mankind was introduced to metallic iron almost 5000 years ago, but it took a long time to learn how to extract iron from ore. This knowledge reached the present-day territory of Lithuania much later, around the turn of the millennium. Almost 2000 years later, with the development of technology, the experience of smelting iron using archaic methods was lost again.

The project "Turning Bog Ore into Gold", initiated by the Kazlų Rūda Tourism and Business Information Center for educational purposes, recalls the activities and crafts related to iron metallurgy in Lithuania. It has been repeated for several years and is unique in two aspects: the search for bog ore during educational activities and the scientific nature of the iron smelting experiments. What we do is not only spectacular iron smelting experiments in the style of living history. Outside the events, a whole series of steps and experiments are carried out to revive the whole technological process from the collection of bog iron ore to the extraction of the "right" metal and slag. The results of the experiments are analyzed morphologically and metallographically and compared with archaeological data. In our experiments, we try to take into account what science and theory say, while remaining open to what our experiments can teach us.

In the presentation, we will first review the experience of ore prospecting and the type of ore we have at our disposal. Then we will look at what kind of iron we are able to smelt, and finally, we will look at what our successes and failures are, the reasons for them, and the way forward.

Results of ground and aeromagnetic surveys for searching for ancient metallurgical objects in the Baikal region in Russia

D. L.A. Onamoun, S.V. Snopkov, K.M. Konstantinov, I.O. Konshin, I.V. Lobuov

Irkutsk Research Technical University

The Baikal region in Eastern Siberia is an archaeologically rich region, including monuments of ancient metallurgy. Geophysical methods are used to search for and study monuments of ancient metallurgy in Baikal region. Due to high values of magnetization of iron reduction pits, the main search method is magnetic prospecting in modification of pedestrian and aerial surveys. In the first stage, the survey is conducted using UAV (unmanned aerial vehicle), which allows for very high-quality surveying over a large area in difficult terrain conditions, taking much less time. Analysis of UAV maps of the total vector and magnetic field gradient revealed positive local anomalies up to 5 m in diameter with amplitudes ranging from 7 nT to 10 nT.

High-precision ground survey was carried out over an area of 300 m^2 on a 1×1 m grid, using the MMPOS - 1 instrument. Magnetometer sensors were installed at a height of 0.5 and 1 m. According to the data of ground magnetic survey, the map of magnetic field anomalies reveals local contrast anomalies with amplitude up to 30 nT, which are interpreted as the effects of near-surface anthropogenic objects. Archaeological excavations of the objects identified by magnetic survey confirmed its effectiveness in the Olkhon region.

Session 3 - Bone

Tuesday 13th May

15:15 - 15:30	**Just perforators and awls? On the possibility of identifying tattoo tools among prehistoric bone artefacts. Experimental, traceological and physicochemical research.** *Karolina Kasperek (online presentation)*
15:30 - 15:45	**New Experiments with Osseous Barbed Projectile Points Provide Insights into Early and Middle Holocene Hunter-Gatherer-Fisher Hunting Techniques** *Grzegorz Osipowicz[1], Justyna Orłowska[1], Lembi Lõugas[2], Heidi Luik[2], Giedre Piličiauskienė[3], Gytis Piličiauska[4], Ilga Zagorska[5] (online presentation)*
15:45 - 16:00	**Impactful Actions: An Experimental Approach to Understanding Labial Striations on Dental Remains.** *Aristeidis Strimenopoulos[1,2], Erica Rosolani[1,2], Carlos Villa Sola[1,2] & Marina Lozano[2,1] (online presentation)*
16:00 - 16:15	**Reference frameworks based on historical sources and experimental designs for the study of archaeological sites in the lowlands of Southeastern South America.** *Lucía T. Rombolá[1], Natacha Buc[2], Mirian Carbonera[3], Daniel Loponte[4], Camila Speller[5], Jay Hilsden[5], Lindsey Paskulin[5]*
16:15- 16:30	Questions and discussion

Just perforators and awls? On the possibility of identifying tattoo tools among prehistoric bone artefacts. Experimental and traceological research.

Karolina Kasperek

Nicolaus Copernicus University

Prehistoric tattoos are identified very rarely, because human mummies on which they are preserved are a unique find. Despite this, you can basically be sure that they were performed very widely and for various purposes. This can be proven by, among others, discoveries such as Princess Ukok from the Pazyryk culture or the so-called Ötzi. Due to the rarity of finds, of prehistoric tattoos, research on them and their commonness is basically impossible. Analyzing the tools used to make them, a relatively large number of which are probably preserved in prehistoric collections, may help solve this problem. The problem, unfortunately, is that these products do not differ at first glance from other (similar in form) artifacts made of stone or bone. However, pathological analyzes may help in their identification.

The aim of the research described in this work was to identify and classify traces of use produced on bone tools used during tattooing. The assumption was that this would allow them to be distinguished from other types of bone tools dating back to prehistoric times, such as needles, perforators, awls, etc.

New Experiments with Osseous Barbed Projectile Points Provide Insights into Early and Middle Holocene Hunter-Gatherer-Fisher Hunting Techniques

Grzegorz Osipowicz[1], Justyna Orłowska[1], Lembi Lõugas[2], Heidi Luik[2], Giedre Piličiauskienė[3], Gytis Piličiauska[4], Ilga Zagorska[5]

[1]Institute of Archaeology, Nicolaus Copernicus University, Szosa Bydgoska st. 44/48, 87-100 Toruń, Poland
[2]Archaeological Research Collection, Tallinn University, Tallin, Estonia
[3] Department of Archaeology, Vilnius University, Universiteto 7, LT 01513 Vilnius, Lithuania
[4]Archaeology Department, Lithuanian Institute of History, Kraziu 5 st., 01108 Vilnius, Lithuania
[5]Institute of Latvian History, University of Latvia, Kalpaka Bulvāris 4, Rīga, LV-1050, Latvia

One of the most essential attributes of the Early Holocene hunter-gatherer equipment is projectile weaponry, particularly barbed points made from osseous raw materials. Traceological analysis of various barbed points has provided crucial evidence for interpreting their function as critical elements of hunter-gatherer equipment. In the microscopic research conducted as part of the project Life and death written in bones. The technological and functional aspect of the osseous artefacts of Early and Middle Holocene hunter-gatherer-fishers communities inhabiting the East Baltic Plain, dozens of morphologically diverse barbed points were analysed. These traceological analyses showed a notable absence of impact breakages typically associated with this type of weapon on utmost artefacts. Given that most of the analysed finds originated from sites with aquatic contexts, a hypothesis was proposed that these artefacts might have been used for hunting aquatic animals. To test this hypothesis, we conducted experimental research to create a reference collection of use-wear traces forming at the surface of different barbed points used to hunt a water pray. Our presentation will present the experiments focused on fish hunting with various methods, including bows and spears. They aimed to understand better the morphological features and distribution of use-wear damage typical for hunting on water pray with bone points and differences relative to points used for hunting terrestrial pray.

The project: Life and death written in bones. The technological and functional aspect of the osseous artefacts of Early and Middle Holocene hunter-gatherer-fishers communities inhabiting the East Balticwas funded by the National Science Centre Poland, project no. 2021/43/B/HS3/00500.

Impactful Actions: An Experimental Approach to Understanding Labial Striations on Dental Remains.

Aristeidis Strimenopoulos[1,2], Erica Rosolani[1,2], Carlos Villa Sola[1,2] & Marina Lozano[2,1]

[1]Facultat de Lletres, Universitat Rovira i Virgili, Tarragona, Campus Catalunya URV, 43003, Spain
[2]Institut Catalá de Paleoecología Humana i Evolució Social (IPHES-CERCA), Campus Sescelades URV (Edifici W3), Zona Educacional 4, Tarragona, 43007, Spain

Detecting patterns and features of enamel alterations related to behavior permits the reconstruction of activities and the understanding of past human practices. The identified dental features, such as enamel chipping and labial striations among others, imply the use of the mouth during the conduction of an activity, thus providing insights into the cognitive level of the studied individuals. Concerning the latter feature, paramasticatory striations can result from the contact of the enamel surface with a harder material, such as a lithic flake, which occurs during the stabilization of an object in the mouth, specifically between the anterior teeth. Notably, the specific practice has been mentioned throughout the lineage of the genus Homo, underlying its prevalence in the behavior during human evolution.

The specific study is laid in the conduction of an experimental procedure to replicate labial striations, which are produced from different raw materials, aiming to understand their morphological differences. The applied raw materials are characterized by different mineral properties (flint, limestone, and quartzite) while originating from diverse geographical latitudes (Spain and the United Kingdom). Furthermore, the existing sample pool consists of both deciduous and permanent teeth, anterior and posterior dentition, while the methodological framework is comprised of the utilization of different pieces of microscopic equipment (an Optical and a 3D Digital microscope), aiming to understand the level of complementation of both of them for the best archaeological interpretation. In this framework, this research aims to provide insights into the identification of the used raw material based on the morphological differentiation of the experimentally produced paramasticastory striations, while advancing methodologically through the combination of different microscopic approaches. The application of this protocol to labial striations from fossil and archaeological teeth will improve our knowledge about the use of teeth as a third hand, providing new approaches to the specific line of research.

Reference frameworks based on historical sources and experimental designs for the study of archaeological sites in the lowlands of Southeastern South America

Lucía T. Rombolá[1], Natacha Buc[2], Mirian Carbonera[3], Daniel Loponte[4], Camila Speller[5], Jay Hilsden[5], Lindsey Paskulin[5]

[1] Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) - Programa de Pós-Graduação em História, Universidade Federal da Fronteira Sul (UFFS). Brazil.
[2] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) - Instituto Municipal de Investigaciones Antropológicas de Chivilcoy - Universidad de Buenos Aires, Facultad de Filosofía y Letras. Argentina.
[3] Departamento de Ciencias Ambientais, Unochapecó - Centro de Memória do Oeste de Santa Catarina (CEOM). Brazil.
[4] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) – Instituto Nacional de Antropología y Pensamiento Latinoamericano. Argentina.
[5] Department of Anthropology, University of British Columbia. Canada.

In the southernmost part of South America, covering present-day southern Brazil, Uruguay, Paraguay, and northeastern Argentina, diverse societies developed, including hunter-gatherers and groups with early agriculture. Written records from the 16th century, when Europeans arrived, provide descriptions of Indigenous peoples, their territories, subsistence, customs, and material culture. In southern Brazil, early European contact was Spanish before Portuguese dominance, which led to the underrepresentation of initial encounters in Brazilian academia.

Historical sources are valuable but challenging to connect with archaeological evidence due to the risk of direct analogies. Experimental archaeology contributes by expanding our understanding of past practices and allows us to establish correlations between historical sources and archaeological sites. In the lowlands of the study area, we conducted experimental research on ceramics and bone technology. Ceramic studies focused on methods for making holes in pottery vessels, while in studies of the operational chain of bone technology, we proposed physical tests to comprehend the selection of bone elements and created a database of local animal proteins using the methodology known as Zooarchaeology by Mass Spectrometry (ZooMS).

Our goal is to develop a reference framework based on historical sources and experimental programs to make interpretations of the archaeological record.

Session 4 - Bone, Wood and Textiles

Tuesday 13th May

16:45 - 17:00	**Analysis and Experimental Replication of Bone Artifacts from the Central Coast of Rio Grande do Sol - Brazil** *Julia Camargo*
17:00 - 17:15	**What do bone tubes from Corded Ware culture sound like? Using Computational Fluid Dynamics simulation to reconstruct acoustic properties of possible Eneolithic music instruments/sound generators.** *Dominika Tokarz[1], Urszula Warzyńska[2] and Tomasz Siwulski[2]*
17:15 - 17:30	**Wooden sleeves from Subneolithic sites in Šventoji, Lithuania. What was their function?** *Grzegorz Osipowicz[1], Justyna Orłowska[1], Gytis Piličiauskas[2], Giedrė Piličiauskienė[3], Grzegorz Skrzyński[4] (online presentation)*
17:30 - 17:45	**Stepping into Hands-On History: Teaching Young Students How to Make Roman Leather Shoes** *Nathalie Roy (online presentation)*
17:45 - 18:00	Questions and discussion

Analysis and Experimental Replication of Bone Artifacts from the Central Coast of Rio Grande do Sol - Brazil

Julia Camargo

Universidade Federal do Rio Grande

Studies conducted in the past indicated the existence of a large number of archaeological sites on the central coast of the Brazilian state of Rio Grande do Sul. Unfortunately, even with this great potential for research, very few archaeological analysis were made on the material collected from the several marine and lacustrine shellmounds and ancient landfills known as “Cerritos” that were registered in the region. Understanding that, this work focuses on giving special attention to the deer bones, antlers and fish vertebrae artifacts fabricated by the groups that once lived there. The goal is understanding the technology and the process of workmanship behind these objects, comprehending that as well as other types of archaeological industries, the bone industry can contribute to the definition of cultural contexts and temporal sequences, thus allowing, amongst other aspects, the recognition of time-space relations, occupation, contact and cultural exchanges between different groups. The first stage of the research classifies and measures them, while also observing taphonomic and manufacturing marks visible under the microscope to raise information about the fabrication process and the resources being used. Later, through Experimental Archaeology, the replication of the bone tools confirms, denies and creates more hypotheses about the crafting process of the artifacts, complementing the analysis being made. In this case, different materials, including granite, basalt, sandstone and shells have been used to cut, scrape and polish bones so the marks they left on the replicated tool could be compared to those observed in archaeological context. Through this systematic investigation of the bone industries found in archaeological sites in the Central Coast of Rio Grande do Sul, this work aims to begin to understand and define its characteristics, the stages of their manufacture and the various ways in which these groups occupied the environment and used its resources.

Keywords: Experimental archaeology; Bone tools; Cerritos;

What do bone tubes from Corded Ware culture sound like? Using Computational Fluid Dynamics simulation to reconstruct acoustic properties of possible Eneolithic music instruments/sound generators.

Dominika Tokarz[1], Urszula Warzyńska[2] and Tomasz Siwulski[2]

[1]Institute of Archaeology, University of Wrocław, Szewska 48, 50-139 Wrocław, Poland
[2]Department of Technical Systems Operation and Maintenance, Wrocław University of Science and Technology, Łukasiewicza 5, 50-371 Wrocław, Poland

CThe paper presents the results of applying CFD simulations to the digital 3D reconstructions of Eneolithic artefacts. The findings included in this project are bone tubes discovered in Corded Ware culture's (CWC) graves. Typically, a single tube has been placed in the grave. Exceptions were recorded in Giebułtów (13 tubes) and Kostelec na Hané (5 tubes). The artefacts are made of mammal or bird bones.

The project's goal is to reconstruct the acoustic capabilities of the CWC bone tubes, specifically answering questions about the maximum possible loudness and frequency of the sound produced by edge-blown flutes. Digital 3D reconstructions of the artifacts were used for the CFD simulations. Computational Fluid Dynamics (CFD) is a branch of fluid mechanics that employs numerical methods to solve problems related to fluid and gas flow. Among other things, it allows for the examination of a digital acoustic environment. In our project, numerical simulations were preceded by physical tests. These tests utilized bone replicas of the artefacts created during experiments. Their 3D models, measurements of frequency, loudness, airflow, and the flute's positioning relative to the air stream enabled the creation of a numerical environment. The measurements were conducted at the Laboratory of Working Machines and Fluid Systems Diagnostics at Wrocław University of Science and Technology.

3D models of the artefacts, obtained through micro-CT scanning and photogrammetry. The simulations provided data on frequency and loudness. The results are varied. It is noteworthy that some frequencies amplified by the artefacts fall outside the human audible range. This could suggest that the pipes were used in relation to animals, for example, to make them aware. In the case of certain artefacts, significant sound loudness was also observed, which may be linked to communication purposes

The project is part of a doctoral dissertation and the NCN Preludium grant "Are they aerophones? Interdisciplinary studies of Eneolithic and Bronze Age bone tubes from central Europe" (no. 2023/49/N/HS3/02566).

Keywords: Music instruments, Experiments, Eneolithic, Aerophones, CFD simulation

Wooden sleeves from Subneolithic sites in Šventoji, Lithuania. What was their function?

Grzegorz Osipowicz[1], Justyna Orłowska[1], Gytis Piličiauskas[2], Giedrė Piličiauskienė[3], Grzegorz Skrzyński[4]

[1] *Nicolaus Copernicus University*
[2] *Lithuanian Institute of History*
[3] *Vilnius University*
[4] *Independent Researcher*

At EAC13, we presented preliminary results of experimental studies and related traceological analysis conducted as part of the study of one of the largest collections of wooden artefacts in Europe dating back to the Stone Age. It comes from the Subneolithic sites in Šventoji in Lithuania. One of the most exciting categories of objects discussed in this talk was the so-called sleeves, i.e. pairs of artefacts considered (due to their form) to be holders of axes and other types of tools. In our talk, we would like to present the results of the latest research on the function of these products, which were conducted as part of the international research project entitled "PlAnt Raw maTerialS in the life of middle Holocene hunter-gatherer-fisher communities of the southeastern coast of the Baltic Sea (PARTS project)". The studies included the results of dendroarchaeological, technological and traceological analysis of these artefacts. They became the basis for planning and implementing the experimental research program, with the primary goal of creating a reference base of use-wear traces forming on wooden objects due to their use as sleeves. During these experiments, replicas of sleeves made of wood species used for this purpose in Šventoji were applied, which were used to mount tools of several types (axes, axes, hoes) made of different raw materials (stone, flint, antler and bone). These replicas were used for a series of activities, the most important of which was woodworking. The reference base of hafting traces created on sleeves was used for comparative studies with use-wear traces observed on artefacts, which enabled the interpretation of their actual function.

Stepping into Hands-On History: Teaching Young Students How to Make Roman Leather Shoes

Nathalie Roy

Glasgow Middle School

In this paper, I will discuss an experimental archaeology project focused on Roman leather shoes that I taught in my Roman Technology class. In this class, the teen-aged students reproduce the products and processes of ancient Roman daily life through STEM challenges, hands-on history labs, and experimental archaeology.

The project began with learning the basics of tooling leather. Through a series of smaller projects such as creating Roman leather bullae, the students learned basic leather-working techniques and tools such as stamps, punches, and awls. To assist with techniques, the students read the scholarship of Dr. Carol van Driel Murray and Dr. Elizabeth Greene. They explored leather shoes from the archaeological record in London, Vindolanda, and northern Europe. They cut patterns and formed their own simple carbatinae (Roman house shoes). Then, the students tested their shoes in a series of surface wear tests. Last, the students reflected on the experience of recreating the work of ancient craftspeople. This group of people is often absent in the literary record so experimental archaeology helps the students to learn more deeply about their lives.

My presentation will present all the steps of the project with details about teaching young students.

Session B (online only) - Public Craft

Wednesday 14th May

8:15 - 8:30	**The Vounous Symposium: Craft as a Tool for Community, Education, and the Development of an Open-Air Museum** *Rauf Ersenal and Dr E. Giovanna Fregni*
8:30 - 8:45	**Oulu2026 European Capital of Culture** *Patrik Franzen*
8:45 - 9:00	Questions and discussion

The Vounous Symposium: Craft as a Tool for Community, Education, and the Development of an Open-Air Museum

Rauf Ersenal and dr E. Giovanna Fregni

Vounous

Since its inception in 2017, the Vounous Symposium's goal has been to raise awareness of Cyprus' rich archaeological heritage. In order to accomplish this, the symposium invited artists and archaeologists to recreate the Bronze Age objects seen in museums around the world.

Vounous has also grown into a community of people who work together, sharing ideas and techniques. Ceramic artists worked with clay that was dug from local sources that were in use during the Bronze Age. This often provided a challenge to artists used to working with modern clays that have different properties.

This year the Vounous Symposium expanded its reach. After the symposium finished, the site was host to school classes with students ranging from grade school to university students. The students learned about the region's prehistory while immersed in the landscape situated adjacent to a Bronze Age cemetery. In addition, the works produced during the symposium are part of a travelling exhibition in schools as well as resorts and hotels, where they will be seen by tourists visiting Northern Cyprus. The site of Vounous is also an exhibition space with new signboards and displays of ceramics. These encourage self-guided walking tours where visitors can appreciate the ancient crafts in the context of the landscape.

In this presentation, we will explain more of the mission of the Vounous Symposium, its growth as a focal point for international participation, and how it is an educational tool for teaching experimental archaeology to people outside the field of archaeology and non-academics. We will also present news about the ongoing development of the site as an open-air museum and how the symposium became the means to create a great opportunity to introduce the past cultural heritage to today's people.

Oulu2026 European Capital of Culture

Patrik Franzen

Kierikki

Kierikki, located in Oulu northern Finland, is one of the most significant Stone Age sites in the Nordic region. It combines an archaeological open-air museum with a research-based exhibition, offering visitors a time travel into life 7000-5000 years ago. The Stone Age Village features reconstructed dwellings, placement for experimental archaeology, and interactive experiences.

As Oulu becomes the European Capital of Culture in 2026, Kierikki will play a key role in showcasing Finland's prehistoric heritage. In 2025, the preparations will focus on expanding the museum's programs, enhancing digital storytelling, and integrating new archaeological research into visitor experiences. The highlight of 2026 will be "Ancient Skills," a project combining live demonstrations, immersive VR/AR applications, and international collaboration with Stone Age craftsmen. This initiative will bring prehistoric knowledge to modern audiences, fostering engagement through hands-on workshops and innovative museum displays.

This presentation will introduce Kierikki's role in Oulu 2026, highlighting how experimental archaeology and cultural heritage can be revitalized in contemporary society. The events during the summer serves as a platform to connect professionals and explore future possibilities for integrating archaeology into public engagement. The year 2026 offers an excellent opportunity to bring experimental archaeology into the public eye across Europe.

Session 5 - Ceramics

Wednesday 14th May

14:00 - 14:15	**Foreign Influence, Kitchenware or both? Experimental Approaches to Cucuteni Type C Pottery** *Maria Cristina Ciobanu and Elena-Camelia Pintilie (online presentation)*
14:15 - 14:30	**Fazendo cerâmica na escola: O uso de casca de arroz carbonizada como antiplástico na pasta cerâmica em substituição a outros antiplásticos** *Clarice Bianchezzi and Adriano Márcio dos Santos (online presentation)*
14:30 - 14:45	**Procreation Worship by the Fire: a Study of Pottery Tuyères Discovered at Bronze Casting Sites of the Shang Dynasty in China** *Bangcheng Tang[1], Xiaoyu Wang[2], Yvette A. Marks[3] (online presentation)*
14:45 - 15:00	**The archaeological experiment of roof tiles production by "back side cut" technology** *Dmytro Moisieiev (online speaker)*
15:00 - 15:15	Questions and discussion

Foreign Influence, Kitchenware or both? Experimental Approaches to Cucuteni Type C Pottery

Maria Cristina Ciobanu and Elena-Camelia Pintilie

"Alexandru Ioan Cuza" University of Iași

Cucuteni C pottery, a distinct category within the ceramic assemblage of the Cucuteni-Trypillia culture, has often been associated with the presence of foreign populations in the East Carpathian Eneolithic environment and with its use in thermal food preparation, due to its technological features and traces of secondary burning. This paper presents preliminary results from an experimental archaeology project that included replicas of Cucuteni C pottery, with crushed shell and vegetal inclusions, and typical Cucuteni vessels without temper for comparison. The main objective was to test hypotheses about the functionality of Cucuteni C pottery and to identify its technical and cultural particularities.

The ceramic replicas, crafted based on archaeological observations and specialised literature, were subjected to a series of practical experiments, such as open-fire cooking, heated-stone cooking, and liquid storage. Observations focused on impermeability, resistance to thermal shocks, and efficiency for various domestic functions. Cucuteni C vessels proved more resistant to thermal fluctuations than typical Cucuteni ceramics, a feature attributed to the crushed shell temper and firing conditions. Usage traces were documented, including changes in colour, formation of organic crusts, potential cracks, and other marks caused by thermal and mechanical stress.

The experiments were complemented by physical and chemical analyses (PXRF, SEM-EDX, micro-FTIR), which confirmed the hypotheses regarding technological and functional differences between Cucuteni C vessels and traditional Cucuteni ceramics. The interpretation of these data in a cultural context suggests that Cucuteni C pottery reflects not only external influences but also local adaptations by prehistoric communities. This research contributes to a reassessment of Eneolithic cultural dynamics and offers new perspectives on how ceramic technologies were integrated into daily life, revealing greater complexity than previously assumed.

Fazendo cerâmica na escola: O uso de casca de arroz carbonizada como antiplástico na pasta cerâmica em substituição a outros antiplásticos

Clarice Bianchezzi and Adriano Márcio dos Santos

CESP/UEA

Através de um projeto de extensão universitária voltado para educação patrimonial temos buscado, desde 2023, colocar o tema do patrimônio arqueológico no cotidiano das escolas do município de Parintins, desenvolvendo atividades de moldagem e decoração de cerâmica. Na preparação da pasta cerâmica estamos usando casca de arroz carbonizada, que substitui o antiplástico mais conhecido na região que é a casca de uma árvore presente na região amazônica que se encontra ameaçada de extinção. Esse tipo de antiplástico tem dado bons resultados, garantido uma boa pasta para manuseio e uma cerâmica resistente no manuseio em relação quando objeto produzido. As atividades de interação com os alunos da educação básica, em escolas públicas, têm oportunizado, além da educação em patrimônio, a reflexão sobre a sustentabilidade e aproveitamento de resíduos orgânicos, como a casca de arroz, na produção da cerâmica artesanal. O projeto tem tido boa recepção nas escolas gerando debates em que o patrimônio arqueológico e o saber fazer cerâmica tem despertado o interesse dos estudantes pela história indígena desta localidade e região amazônica.

Palavras-chave: Educação patrimonial; Patrimônio arqueológico; Cerâmica; Antiplástico; Casca de arroz carbonizada

Procreation Worship by the Fire: a Study of Pottery Tuyères Discovered at Bronze Casting Sites of the Shang Dynasty in China

Bangcheng Tang[1], Xiaoyu Wang[2], Yvette A. Marks[3]

[1] *Sichuan University*
[2] *Chongqing Three Gorges University*
[3] *University of Sheffield*

By applying the research method of experimental archaeology, the pottery tuyères unearthed from the bronze casting sites of the Shang Dynasty in China have been experimentally archaeologically reconstructed, and the process of smelting bronze using these tuyères has also been reconstructed. The experimental results show that the cap-shaped or umbrella-shaped structure of the tuyères in the Shang Dynasty of China is conducive to preventing the tuyères from breaking due to uneven heating during the bronze smelting process, thus increasing the reusable rate of the tuyères and helping to ensure the continuous progress of the bronze melting operation. From the perspective of typological research, the pottery tuyères may symbolize the male genitalia, and the characteristics they exhibit during pyrotechnic operations together constitute a symbol of reproduction. The furnace can be regarded as a metaphor for the female body. During the bronze casting process, the bronze casting craftsmen, the pottery tuyères, and the furnace jointly constitute a reproductive activity, and the cast bronze wares are the products of this activity. Based on this, the view is put forward that the sacrificial phenomena at the bronze casting sites of the Shang Dynasty may originate from the production rituals based on reproductive concepts.

Keywords: experimental archaeology, bronze casting sites, tuyères, sacrifice in Shang Dynasty, reproductive worship

The archaeological experiment of roof tiles production by “back side cut” technology

Dmytro Moisieiev

Crimean Institute of Strategic Studies

The roman tile production technology is well known. We understand its functioning, tools and ways of transformations into other analogous technologies. Instead, in the Mediterranean and the Black Sea regions there is another, more technologically advanced method of tile production. Produced with this method building ceramics have common features as imprints of parts of matrix-boxes and relief decorations (for example, the face of Jesus, 5-6 c., Tunisia; or folk hero, 13-14 c., Crimea). “Back side cut” technology is known in Tunisia, Israel, Jordan, Macedonia, Bulgaria, Armenia, Georgia, Cirkassia, Crimea and on the Lower Don. But most common it is in Crimea.

At present this technology is lost. Therefore, an archaeological experiment was organized to reproduce one of the most significant parts of “back side cut” technology – a wooden matrix-box, where tiles with relief decorations had been molded. Flanged tiles from excavations of Crimean sites of the 8th-9th centuries were used in this experiment as an archaeological source.

Archaeological experiment showed that the main secret of “back side cut” technology was the removal of tiles from matrix-box after molding. At-first, it was investigated that it is very hard to remove a wet tile from the matrix-box – side flanges were gluing to the wood. At-second, the cracking and disintegration of flanged tile became the result of the drying in the matrix-box. Reduction of shrinkage of a tile by different admixtures to fabric didn`t solve these problem. Cutting the flanges of tile in the matrix-box couldn`t be a solution because Crimean archaeological tiles often had imprints of wood on outer side of flanges. However, we found it in the design of matrix-box with removable side panels. Thus, a flanged tile was removed from matrix-box without any damaging and gluing of side flanges to it. After the 12th modeling a wooden lock on the removable side of the panel had broken. Imprints of this damaging of matrix-box became visible on the outer part on side flange. The same imprints are known on medieval tiles from Partenit and Chersonesos. This archaeological example confirmed the success of the archaeological experiment.

Session 6 - Ceramics

Wednesday 14th May

15:15 - 15:30	**Temper of animal and human-related origin in prehistoric ceramics in the light of experimental, traceological and physicochemical studies** *Maria Kurant (online speaker)*
15:30 - 15:45	**As pastas cerâmicas e a queima à lenha: processos ameríndios** *Lilian Panachuk, Isabela Veigas*
15:45 - 16:00	**Reconstructing the Incrustation Technique: Experimental Insights into Post-Firing Decoration of Prehistoric Pottery** *Andreja Kudelić, Natali Neral and Ina Miloglav*
16:00 - 16:15	**Insights into Raw Material Selection in Prehistoric Pottery: Experimental Study of Physical and Mechanical Properties of Ceramics** *Natali Neral, Andreja Kudelić, Ana Maričić*
16:15- 16:30	Questions and discussion

Temper of animal and human-related origin in prehistoric ceramics in the light of experimental, traceological and physicochemical studies

Maria Kurant

Nicolaus Copernicus University

In prehistory, clay intended for the production of ceramic vessels was subjected to various processes aimed at improving its technical parameters, e.g. softening, or preventing shrinkage and cracking during drying and firing. One of them was adding various types of temper. In Neolithic and sub-Neolithic cultures, these were very often tempers made of organic materials of animal origin, and sometimes, perhaps, related to the human body. The significance of such practices often went beyond the purely utilitarian sphere, related to the material and spiritual culture of prehistoric communities, which makes it an important issue for the study of prehistory.

Unfortunately, so far, only some types of the most common temper of this kind, such as shell and bone, have been covered by broader studies. Identifying others in historical material is still complicated. This presentation aims to introduce an attempt to answer the question about the possibility of recognizing and distinguishing "atypical" organic additives that could have been used as temper in Neolithic and Sub-Neolithic pottery (e.g. meat, blood, hair, nails, wool, fur, eggshells).

The conclusions were based on experimental archaeological research, microscopic studies and physicochemical analyses (SEM-EDX, GC-MS). The research aimed to develop a method that would allow for the reliable identification and classification of such temper found in prehistoric pottery. The results of the experimental studies were verified by analyzing fragments of Sub-Neolithic pottery from a complex of sites in Šventoji in Lithuania.

As pastas cerâmicas e a queima à lenha: processos ameríndios

Lilian Panachuk[1], Isabela Veigas[2]

[1] *Faculdade de Filosofia e Ciências Humanas, Universidade Federal de Minas Gerais.*
[2] *Departamento de Faculdade de Filosofia e Ciências Humanas, Universidade Federal de Minas Gerais*

Nas terras baixas da América do Sul, no contexto ameríndio, a pasta de argila utilizada na olaria tradicional é construída de diferentes maneiras. Por exemplo, as mulheres Asurini do Koatinemo, falantes do tronco Tupi associado à família Tupi-guarani, não acrescentam nada à pasta (SILVA, 2000). As ceramistas Urubu-Kaapor, da mesma família Tupi-guarani, acrescentam a cinza de caraipé (RIBEIRO, 1996). Falantes da língua Tupi-Mondé, as ceramistas Paiter Suruí retiram elementos da pasta e sovam bastante a massa (VIDAL, 2011, 2013, 2017).

As ceramistas Karajá, falantes de Macro-jê, deixam o barro secar e pulverizam, peneiram eliminando impurezas, para depois hidratar o pó de argila (WHAN, 2010). Acrescentam cinza de "cega machado" qual o nome da árvore? à massa, com proporções de água bem definidas, como salientou Whan (2010), a madeira dura é muito apropriada para a queima lenta e controlada.
As ceramistas Kadiweu, de língua Guaycuru, adicionavam à massa de argila, até o final do século XIX, pó de coco torrado (Guido Boggiani, 1945), e chamote (Herbert Smith, apud MULLER, 2017). Darcy Ribeiro (1980) e Lévi-Strauss (2001) viram a mudança para o uso do chamote ou cinzas, sendo comum atualmente também a areia.

Nessa pesquisa nosso Grupo de estudos do Simbólico e Técnico da Olaria deseja apresentar alguns resultados da combinação das massas em queima à lenha, para debater sobre características dos materiais e resultados. Essa pesquisa resulta do apoio financeiro obtido pelo EDITAL UFMG PRPq – 09/2023, projeto é intitulado "Entre saberes de artistas e cientistas da olaria tradicional: preparo da argila e comportamento físico dos materiais cerâmicos".

Palavras-chaves: Pastas cerâmicas, características de materiais, saberes ameríndios, resultados de queima.

Reconstructing the Incrustation Technique: Experimental Insights into Post-Firing Decoration of Prehistoric Pottery

Andreja Kudelić[1], Natali Neral[1] and Ina Miloglav[2]

[1] *Institute of Archaeology*
[2] *University of Zagreb*

The incrustation technique used to decorate ceramic vessels was widespread in prehistoric pottery across Europe, particularly during the Copper and Bronze Ages in the Pannonian Basin and the Balkans. While several studies have analyzed the composition of the white inlay, the exact application procedure—especially regarding the binder and the method of applying the inlay—has remained unexplored.

This research introduces, for the first time, a proposed recipe, technique, and manufacturing sequence for the white inlay used to decorate prehistoric pottery. The findings are supported by integrated analytical methods and an archaeological experiment. Compositional analysis of inlays preserved on Copper and Bronze Age ceramics from Croatia reveals recipes consistent with those documented in the Pannonian Basin, identifying three key components: hydroxyapatite (from bone material), aragonite (from mollusk shells), and calcite, which were tested in the experiments
According to the proposed hypothesis, burning (endothermic reaction) of these raw materials at temperatures above 700 °C and slaking (exothermic reaction) should result in plastic, but durable and solid material i.e. lime-based plaster. Experimental results confirmed this hypothesis, demonstrating that the plaster from mollusc shells and the bone material represents the basic technological procedure by which the incrustation was made and applied to the ceramic vessels as a post-firing decoration technique.

Keywords: Incrustation technique, Copper and Bronze pottery, Croatia, White inlay, Hydroxyapatite, Aragonite, Lime-based plaster

Insights into Raw Material Selection in Prehistoric Pottery: Experimental Study of Physical and Mechanical Properties of Ceramics

Natali Neral[1], Andreja Kudelić[1], Ana Maričić[2]

[1] *Institute of Archaeology*
[2] *University of Zagreb*

The selection of raw materials is an essential step in pottery production, determining the quality and functionality of the final ceramic products. This selection process is shaped by the interplay of raw material availability, the optimization of production techniques, functional requirements, and cultural considerations (Rice 1987, Arnold 2000, Livingstone Smith 2000, Gosselain et al. 2005). The analysis of these raw materials, including clays and tempering materials, provides essential insights into the factors guiding these choices.

This study therefore investigates the physical and mechanical properties of ceramics and their raw materials to evaluate how variations in clay composition and tempering materials influence technological process in terms of paste preparation, shaping and firing, and the mechanical properties of ceramics. Additionally, it examines whether these raw material selections were driven by resource availability, functional needs, or other factors and whether these considerations applied equally to clays and tempering materials.

The study focuses on two clay types—sandy clay and inclusion-poor clay—and four tempering materials: calcite, grog, sand, and vegetal material, all commonly utilized in prehistoric pottery production in Croatia. The methodology includes testing the plasticity (analysis of the Atterberg limits) and shrinkage of the clays, as well as point load index testing of 56 experimental ceramic briquettes made using different recipes.

The findings reveal that inclusion-poor clay, with a high clay mineral content and fewer crystalloclasts, demands a more intricate preparation and shaping and extended firing process but yields stronger ceramics. In contrast, sandy clay, abundant in crystalloclasts like quartz and feldspar, is easier to process and fire but produces ceramics of lower strength. Additionally, the study shows that the effect of tempering materials is strongly influenced by clay type, with a more significant impact on inclusion-poor clay.

Consequently, the results of the experiments highlight how variations in clay composition shape ceramic production processes and mechanical properties, underscoring the need for potters to adapt their techniques to the specific characteristics of the clay. Communities that selected sandy clay prioritized its ease of preparation and firing, whereas the deliberate use of inclusion-poor clay, despite its more demanding processing, reflects a strategic preference for functional advantages such as enhanced strength and durability.

Keywords:Raw material selection, Clay composition, Tempering materials, Physical and mechanical properties, Ceramic production techniques, Prehistoric pottery, Functional requirements

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Session 7 - Ceramics and Other Materials

Wednesday 14th May

16:30 - 16:45	**Ceramic perforation techniques in hunter-gatherer sites from the Lower Paraná Wetland: An experimental approach** *Lucía T. Rombolá, Sheila Ali, Lucas González Nogueira, Clara Álvarez Cortina, Mirian Carbonera, Natacha Buc*
16:45 - 17:00	**Carimbos arqueológicos: experimentações em cerâmica, têxteis e suportes rochosos** *Claudia Inês Parellada*
17:00 - 17:15	**Bridging Past and Present: Experimental Archaeology Meets Public Engagement** *Adina Amăriuței, Maria-Cristina Ciobanu, Analisa Ariton, Elena-Camelia Pintilie, Bogdan-Ștefan Novac, Felix-Adrian Tencariu (online speaker)*
17:15 - 17:30	**Thombek 'Rerré: fogo bom e seus instrumentos de criação** *Danilo Campos Borum-Kren and Lilian Panachuk*
17:30 - 17:45	Questions and discussion
17:45 - 18:00	Closing

Ceramic perforation techniques in hunter-gatherer sites from the Lower Paraná Wetland: An experimental approach

Lucía T. Rombolá[1], Sheila Ali, Lucas González Nogueira[2], Clara Álvarez Cortina[2], Mirian Carbonera[3], Natacha Buc[4]

[1] *Universidade Federal da Fronteira Sul (UFFS)*
[2] *Instituto Nacional de Antropología y Pensamiento Latinoamericano*
[3] *Centro de Memória do Oeste de Santa Catarina (CEOM)*
[4] *Instituto Municipal de Investigaciones Antropológicas de Chivilcoy - Universidad de Buenos Aires*

Around 2,400 years ago, hunter-gatherer groups in the Lower Paraná Wetland maintained high residential stability, enabling them to produce large quantities of pottery for cooking, storage, and transport. While most studies focus on manufacturing processes, form, and decoration, technological aspects like perforations or suspension holes remain understudied. Besides, the analysis of ceramic technology often overlooks the tools used, as many were made from perishable or unmodified materials that are difficult to identify archaeologically. Experimental studies in the region suggest that certain bone tools, primarily used for polishing, may have also been used for plant and leather work. Microwear traces on their mesial sections support their role in pottery production, while marks at the apex indicate their potential use in making perforations.

This study evaluates how hunter-gatherers created holes in ceramic vessels through experimental replication with local raw materials. We test different perforation techniques using tools made from wood (Vachellia caven, Parkinsonia aculeata, Enterolobium contortisiliquum, Erythrostemon gilliesii), fish spines (Pterodoras granulosus, Pimelodus maculatus), and a coypu incisor (Myocastor coypus). We document the shape of the perforations at different stages of the clay's drying process and compare them with archaeological ceramic fragments to assess technological choices and tool effectiveness.

Carimbos arqueológicos: experimentações em cerâmica, têxteis e suportes rochosos

Claudia Inês Parellada

PPGAA UFPR

Os estudos visaram ampliar as discussões sobre a utilização de carimbos em contextos arqueológicos e etnográficos no leste da América do Sul, levantando diferentes matérias-primas e as múltiplas possibilidades de impressão em variados suportes. A metodologia baseou-se em amplas análises bibliográficas, imagéticas e tridimensionais em reservas técnicas e exposições, como as das coleções do Museu Paranaense, entre outros acervos institucionais. Assim, foi desenvolvido um banco de dados digitais, sintetizando especialmente aspectos culturais, morfológicos, arqueométricos e simbólicos. A partir da análise multivariada desses cachimbos houve a seleção de 15 modelos, com maior volume de dados, nos quais foram elaboradas experimentações com réplicas e o uso de variados pigmentos e fixadores sobre argila, cerâmica, têxteis, pele, ossos e suportes em rochas e minerais selecionados. Buscaram-se observar e documentar, através de imagens e narrativas textuais, as características diagnósticas, as tecnologias envolvidas e possíveis pigmentos e/ ou compostos associados. Os experimentos foram repetidos várias vezes, evidenciando que se alcançavam resultados assemelhados desde que as condições mecânicas (pressão e força), de textura e geometria do suporte, bem como as ambientais fossem parecidas, e que alterações climáticas, como, por exemplo, o aumento de umidade e/ ou da temperatura, influenciam e alteram qualitativamente as impressões.

Palavras-chave: Carimbos arqueológicos, carimbos etnográficos, arqueologia experimental, América do Sul, arqueometria

Bridging Past and Present: Experimental Archaeology Meets Public Engagement

Adina Amăriuței, Maria-Cristina Ciobanu, Analisa Ariton, Elena-Camelia Pintilie, Bogdan-Ștefan Novac, Felix-Adrian Tencariu

"Alexandru Ioan Cuza" University of Iași

This paper examines the convergence of experimental and public archaeology through our recent endeavors in (re)constructing ceramic firing kilns inspired by the Cucuteni-Trypillia culture (ca. 5000-3500 BCE). Over the past decade, our team has conducted numerous open-air experiments aimed at understanding the construction, functionality, and use of Eneolithic ceramic kilns. The experiments involved building three kilns in open-air settings, using traditional materials and techniques. The goal was to test the efficiency of the kiln design and gather data on the firing process. The results demonstrated the effectiveness of the dual-chambered updraft kiln in achieving high temperatures and producing well-fired pottery. These experiments have not only advanced our knowledge of prehistoric ceramic technologies but also equipped us with the expertise necessary to create an innovative and immersive educational exhibit.

Our most recent project involved constructing a full-scale kiln within the History Museum of Piatra Neamț. This kiln was built using authentic materials and techniques, reflecting the cultural and technological practices of the late Cucuteni-Trypillia phase. Beyond its physical authenticity, the installation incorporates creative enhancements such as flame-simulating LEDs, painted ceramics, and a rotating modeling stand. These features aim to simulate the active use of the kiln and bring prehistoric technology to life for museum visitors. The exhibit bridges the gap between academic research and public engagement by transforming archaeological experimentation into a tangible, relatable, and visually compelling experience.

This presentation will explore the iterative process of experimenting with kiln (re)constructions, from outdoor trials to a museum-ready installation. We will discuss how the lessons learned from open-air experimentation informed the design and interpretation of this exhibit. By demystifying the complexities of prehistoric ceramic production, we aim to make these ancient technologies accessible and engaging for non-specialist audiences. Ultimately, our work demonstrates how experimental archaeology can serve as a dynamic tool for both scientific inquiry and the democratization of knowledge about the past, fostering deeper public appreciation for ancient innovations.

Thombek 'Rerré: fogo bom e seus instrumentos de criação

Danilo Campos Borum-Kren and Lilian Panachuk

[1] *Universidade Federal de Ouro Preto*
[2] *Universidade Federal de Minas Gerais*

O interesse desse resumo é tratar de dois movimentos, envolvendo indígenas e não indígenas. De um lado a retomada Borum-Kren em suas práticas tradicional, cantos, língua e território, investindo empenho em utilizar a arqueologia experimental como prática ancestral, como disse o cacique Danilo Borum-Kren. De outro, essa conexão entre as ações realizadas pela comunidade indígena e as atividades desenvolvidas com equipe de arqueologia experimental tem gerado diferentes questões envolvendo as marcas de instrumentos líticos: como o soquete para produção de fogo com arco e broca, por exemplo. Os experimentos com lascamento para produção de arco e flecha, bem como as atividades práticas têm levado indígenas e não indígenas a olhar para os instrumentos líticos de Minas Gerais com olhos renovados.

O interesse deste trabalho é debater sobre produção de instrumentos e suas marcas, tendo como princípio práticas colaborativas de pesquisa, acolhendo uma arqueologia experimental que envolve fazimentos e produções materiais e também saberes, cantos, expressões nativas.

Palavras-chaves: Saberes tradicionais, produção lítica, criação do fogo bom.