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# **26th EAA Virtual Annual Meeting**

## **Abstract Book**

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# 26th EAA Virtual Annual Meeting

## Abstract Book

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### 26th EAA Virtual Annual Meeting – Abstract Book

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**BUILDING UP THE MOMENTUM IN ARCHAEO-GEOPHYSICS: THE “SOIL SCIENCE & ARCHAEO-GEOPHYSICS ALLIANCE” (COST ACTION SAGA-CA17131)**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Cuenca-Garcia, Carmen (Norwegian University of Science and Technology - NTNU) - Sarris, Apostolos (Foundation for Research and Technology, Hellas) - De Smedt, Philippe (Ghent University) - Horak, Jan (Czech University of Life Sciences)

**Format:** Regular session

Taking into account the current deluge of societal challenges (climate change, conflict, economic crisis, inter alia) the development of field solutions and best practice to record archaeological assets in a more sustainable manner (i.e. using less invasive, rapid and cost-effective approaches) is an obvious priority in cultural heritage management. In this context, the employment of geophysical techniques has become a powerful approach in archaeological discovery, characterisation and monitoring. In the last decade, geophysical methods have developed rapidly, based on phenomenal breakthroughs in technology. Now, large multi-array instruments can be vehicle towed or more compact sensors mounted on robotised vehicles. This has enabled ever faster and higher-resolution geophysical characterisation of larger areas, increasing the efficiency of subsurface archaeological investigations and allowed the exploration of what were, previously, challenging or inaccessible sites.

This exciting technological momentum calls for further progress in field method optimisation and data interpretation solutions to ensure a sustainable development of the discipline of archaeo-geophysics. How efficiently can we analyse, interpret and classify massive geophysical datasets (Big geodata)? How can we improve data integration generated by multi-variate approaches? Which strategies can we follow to provide more confident and archaeologically meaningful interpretations of geophysical datasets? How can we optimise the methodologies in terms of the environmental conditions? These are some of the challenges that archaeo-geophysics is currently facing.

This session is organised by COST Action SAGA, an international research network bringing together archaeologists, geophysicists and soil scientists to advance geophysical data interpretation for archaeological studies. SAGA invites paper proposals on reflective or case-study-based work relating to the above-mentioned challenges and these related topics:

- Combined approached using geophysics and soil science to study archaeological sites/landscapes beyond bare prospection (i.e. present/absence of features)
- Geophysical characterisation or monitoring of archaeological sites in risk
- Big/multi-variated/difficult data: solutions for modelling, analysis and interpretation.

**ABSTRACTS**

**1 REACHING 2 YEARS OF COST ACTION SAGA: WHAT IS DONE, WHAT IS COMING**

**Abstract author(s):** Cuenca-Garcia, Carmen (NTNU)

**Abstract format:** Oral

The ‘Soil science & Archaeo-Geophysics Alliance: going beyond prospection’ (SAGA) is an interdisciplinary network of scientists. The network integrates, inter alia, geophysicists, archaeologists, soil scientists and geologists with interests in subsurface cultural heritage and working in academic, management or commercial environments. Since October 2018, SAGA is developing, promoting and facilitating research activities bringing together archaeo-geophysics and soil science with the overall goal of maximising interpretation of proxy data for archaeological purposes. The network and related activities are funded by the European Cooperation in Science and Technology (COST) and the grant is administrated by the Norwegian University of Science and Technology (NTNU). SAGA is coordinated by a Management Committee currently composed of 99 experts from 36 countries. Participation in the network and its activities, is open to institutions and individuals with strong interests in contributing towards SAGA’s objectives. This presentation aims to reflect on the activities that has been done by SAGA (i.e. SAGA meetings, training schools, workshops, short-term scientific missions) and inform on what is coming up for the next 2 years.

**2 THE NEOLITHIC SITE OF GORJANI–KREMENJAČA REVISITED: RESULTS FROM MAGNETIC PROSPECTION, CORING AND ARCHAEOLOGICAL TRENCHING**

**Abstract author(s):** Meyer, Cornelius (cmprospection) - Šošić-Klindžić, Rajna (Filozofski fakultet u Zagrebu) - Bakrač, Koraljka (Croatian Geological Survey)

**Abstract format:** Oral

The Neolithic site of Kremenjača, located 1 km to the east of the village of Gorjani (Osijek-Baranja County, Croatia) was first mentioned in the 1960s (Dimitrijević, 1968). Its identification based on surface finds attributed to the Starčevo and Sopot cultures, however, its dimensions and settlement chronology remained widely unclear. The systematic archaeological investigation of the site only started in 2015. So far, four trenches were opened, revealing both, Bronze Age and Neolithic material. Moreover, potential house structures were excavated containing burnt daub, compacted yellow loess and post holes (Šošić Klindžić et al., 2019). Magnetic prospection was started on a smaller test area in 2016. During three campaigns in autumn 2018 and 2019 an area of 20 hectares was surveyed using a multi-sensor fluxgate gradiometer array with GPS-RTK positioning. The large-scale data show

3 dense settlement structures with a complex stratigraphy and a complex system of circular ditches covering an area of at least 20 hectares. The results of the most recent survey on areas in the northeastern surroundings of Kremenjača, question the “site” concept. The data show traces of another Neolithic settlement core in a distance to the assumed centre of the ditch systems of 600 m, and bridge to another ring ditch, the site of Gorjani–Topola, so that a larger prehistoric agglomeration of at least 50 hectares can be assumed. Excavation and magnetic prospection were accompanied by coring, both in the central part of the Kremenjača settlement and in the surrounding outer ditch system. A joint interpretation of all data sets contributes to understand the settlement development and the to set up chronology of this Prehistoric complex. The presented example prove that substantial archaeological information can be gathered even from fragmented data sets, including magnetic survey, excavations and coring.

### 3 SEARCH FOR INVISIBLE BURIAL SITES IN CENTURIES-LONG PLOWING ZONES: GEOPHYSICAL DATA INTERPRETATION CHALLENGES, CAPABILITIES AND LIMITATIONS (SUZDAL OPOLIE)

**Abstract author(s):** Erokhin, Sergey (Institute of Archaeology, Russian Academy of Sciences) - Krasnikova, Anna (State Historical Museum) - Modin, Igor (Moscow State University) - Shorkunov, Ilia (Institute of Geography, Russian Academy of Sciences) - Ugulava, Nani - Milovanov, Sergey (Institute of Archaeology, Russian Academy of Sciences)

**Abstract format:** Oral

In the Suzdal Opolie region the archaeological searching for medieval rural settlements is much more effective than it is for the burial sites. Predictive modeling based on settlement position and surrounding topography provides too extensive areas for the practical search. Even if we identify the area where the burial site is located, we still do not know its boundaries and structure.

Geophysical methods seem to be the natural choice for this problem. But here we face a fierce data interpretation challenge due to the absence of objects with contrast physical properties: rural burial sites of X-XII cc. contain neither stone or brick constructions nor enough metal objects for confident detection. Thus, the geophysical data reflects a superposition of archaeological objects and comparatively low-contrast soil heterogeneity. The latter is controlled mostly by the host rock (Late Valday periglacial loess) irregularities, corresponding cryogenic phenomena, successive paleosoil/soil formation and historical-time agrogenic transformations. To distinguish between the soil heterogeneities and burial site archaeological objects with irregular shape, one should treat the archaeo-objects as more or less local features disturbing the natural soil structures, the latter themselves defined from the geophysical data interpretation, based on soil sampling.

For Shekshovo burial site we verified the geophysical results (7.2 ha) by excavation trenches (2800 sq.m) in several parts of the area. The verification results showed the high potential of the devised interpretational approach for the investigation of invisible necropolis structure, with maximal reliability in the discovery of barrows. The interpretation based on considering the natural soil structures enabled to obtain statistical rate of identification for individual burials in ground graves, acceptable for ascertainment of the burial sites boundaries and for mapping of their internal arrangement.

The work was supported by Russian Scientific Foundation grant №19-18-00538.

### 4 “WHY ISN’T IT WORKING?!” - WHEN ARCHAEO-GEOPHYSICAL PROSPECTION MEETS UNFAVOURABLE GEOLOGICAL CONDITIONS

**Abstract author(s):** Pisz, Michal - Mieszkowski, Radosław (Faculty of Geology, University of Warsaw) - Hegyi, Alexandru (Department of History and Archaeology, University of Cyprus) - Filipowicz, Michał (Independent Researcher)

**Abstract format:** Oral

Basic principles of operation of geophysical equipment, as well as good field practice is well known to all who professionally deal with archaeo-geophysics. According to published Guidelines and Handbooks, magnetometry is a “working horse” of archaeological prospection and should be always considered as one of the basic surveying methods. We all know many examples of astonishing magnetic maps, sometimes so sharp and clear that even deceptively resembling aerial pictures or maps of actual unearthed remains.

However, probably most of us experienced these tough and unsatisfying moments, when after a whole day of measurements conducted on a very promising site, a solid gray rectangle is the picture which appears on the screen of our computer.

Usually, we can find an explanation of this phenomenon. Sometimes we need some further research and analysis in order to find it. It is essential though for the clients to understand that archaeo-geophysics is not a “magic wand” for detecting (or creating!) archaeological objects.

In this paper we would like to present some examples of impressive fails and disappointments of magnetometry as well as discuss possible explanations of the reasons of these occurrences. We would like to emphasize the fundamental need to plan geophysical research and analyze geophysical data together with local geology and the importance of soil science in the proper interpretation of geophysical data.

### 5 SAGA WORKING GROUP 3 – SEARCHING FOR INNOVATIVE WAYS OF DATA ANALYSIS AND INTEGRATION: COMPOSITIONAL DATA EXAMPLE

**Abstract author(s):** Horak, Jan - Janovský, Martin (Czech Univ. of Life Sciences, Dept of Ecology)

**Abstract format:** Oral

The presentation is focused on two topics: first is planned to be a general presentation of the working group 3 of SAGA (WG3), which deals with „data integration, visualization and parametrization“. The work inside the WG3 was focused on many activities and tasks performed by the WG3 participants during last two years. The first part of presentation should briefly describe the tasks and the results of these activities. Second topic is planned to present one of these activities in closer look. The data we usually work with can be analysed by many ways, usually the structure of the data enable to use multivariate statistics. Such methods are usually applied on data analysed in Euclidean space. Nevertheless such approach is not the only one, there are other possibilities, which - in some cases like geochemical data - should be even used preferably. One of such approaches is to analyse the data as compositional data. As we have good results with such approach used on geochemical data in archaeology, we decided to find, if the geophysical data in archaeology could be seen as compositional data. If so, what would the results be?

This research/study/work was supported by a STSM Grant from COST Action SAGA: The Soil Science & Archaeo-Geophysics Alliance - CA17131 (www.saga-cost.eu), supported by COST (European Cooperation in Science and Technology). The authors activities in this project were also supported by project “Geochemical insight into non-destructive archaeological research” (LTC19016) of sub-program INTER-COST (LTC19) of program INTEREXCELLENCE by Ministry of Education of Czech republic.

### 6 COMBINING GEOPHYSICAL AND PALAEOENVIRONMENTAL DATA TO STUDY HUMAN ADAPTION TO LANDSCAPE CHANGE – NEW RESEARCH DIRECTIONS

**Abstract author(s):** Stamnes, Arne (NTNU University Museum, Department of Archaeology and Cultural History) - Kristiansen, Søren (Department of Geoscience, Aarhus University)

**Abstract format:** Oral

By combining geophysical and palaeoenvironmental data, it is possible to gain improved insight into the causal effects for landscape change and human-environment interactions. In a previous case study in Limfjorden, Denmark, it was in high details possible to study how human settlements adapted to gradual landscape changes by combining an improved relative sea-level curve based on optically simulated luminescence of beach ridges, digital terrain models and a comprehensive archaeological finds database. In this paper, we will discuss the next steps for cost-efficiently selection of archaeological sites in this marine foreland based on existing data, and adapt geophysical strategies to gain increased archaeological insight on sites within marine forelands. Large-scale electromagnetic induction (EMI) mapping of in Denmark have shown how this geophysical technique can create 3D-paleolandscape models, e.g. delineate coastlines and channels in Illerup Ådal dating from the 3rd century BC to 5th century AD. In Norway, several large-scale and high-resolution ground penetrating radar (GPR) surveys demonstrates how this method can be used for imaging palaeochannels, raised beach ridges and meandering river deposits in high-definition. Therefore, we suggest new research directions in the Limfjorden and similar glacio-isostatic adjusted (GIA) areas based on these geophysical experiences. We argue that this work will have relevance both to study past human adaption to landscape changes, and importance in meeting the effects of present-day climatic changes and prepare for future coastal landscape alterations caused by climate change.

#### a. COST ACTION SAGA 171131

**Abstract author(s):** Cuenca-Garcia, Carmen (NTNU)

**Abstract format:** Poster

Geophysical prospection currently stands as a powerful method in archaeology to study sites in a non-destructive and minimally invasive manner. In the last decade, major technological developments have revolutionised archaeo-geophysical research. These technological breakthroughs have allowed the implementation of extremely fast and high-resolution surveys to discover, explore, record and monitor sub-surface archaeological sites and landscapes. To promote an adequate use of geophysics in archaeological research as well as to advance in geophysical data interpretation beyond basic prospection (presence/absence of possible archaeological features), the Soil science & Archaeo-Geophysics Alliance (SAGA) was funded by the EU COST Association. COST Action SAGA (CA17131) is a research network, which brings together archaeologists, geophysicists and soil scientists from 36 countries. The project started on 26 October 2018 and will run until 25 October 2022. This poster will summarise the goals and structure of COST Action SAGA and will complement the oral contribution on SAGA provided during Session #35.



INVISIBLE EXCAVATION: ARCHAEOLOGY AND CULTURAL HERITAGE SCIENCE OF ORGANIC MATERIALS FOR RECONSTRUCTING RITUAL PRACTICES AND DIET

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Fundurulic, Ana (Sapienza University of Rome; University of Évora, HERCULES Laboratory) - MacRoberts, Rebecca (University of Évora, HERCULES Laboratory) - Bedić, Željka (Croatian Academy of Sciences and Arts)

**Format:** Regular session

Organic materials of plant and animal origin are a great source of information for the detection of changes in dietary habits, rituals, technological practices, trades, and past environmental conditions in different archaeological contexts. Since they are more susceptible to decay and biological oxidation, organic materials are not always preserved in their integral state and can be overlooked during archaeological excavation. However, this knowledge is not lost, being “hidden” as micro-remains, organic residues, ancient DNA, chemical structures or isotopic ratios. Developing new technologies, cultural heritage science and interdisciplinary approaches, allow the well of information to be unearthed in laboratories, museums and conservation centers. This potential should not be ignored, but encouraged to build a comprehensive mosaic of human diet in the past, as well as to shed a light on the organic materials employed in sacred rituals.

A wide spectrum of subjects with a particular emphasis on methodologies and the use of advanced techniques for the analysis and reconstruction of diet and ritualistic behavior, as well as case studies are welcomed. Talks can address but are not limited to the following topics:

- Best strategies and practices employed for sampling, collection, preservation and conservation of organic materials in different archaeological contexts
- Existing methodologies and techniques applied to the study of archaeological organic materials as well as pioneer lines of research
- The challenges of the recognition and value of organic materials in the archaeological record
- The preventive aspects for organic materials and their identification in the archaeological record
- Reconstruction of human dietary habits in Europe from Prehistory to Modern Times
- Organic materials as evidence for ritualistic behavior
- The social and spiritual aspects mirrored in archaeological materials of organic sources.

ABSTRACTS

1 SAMI OFFERINGS, ENVIRONMENTAL CHANGE AND INSECT ASSEMBLAGES FROM NORTHERN NORWAY

**Abstract author(s):** PanagiotasKopulu, Eva (School of GeoSciences, University of Edinburgh)

**Abstract format:** Oral

Using palaeocology and in particular palaeoentomology to understand climate and environmental change and impacts by indigenous groups in the North Atlantic Arctic fringe provides the opportunity to obtain refined details about both the rates of impact and the timing of the change from hunting and gathering to farming. In northern Norway the Sámi coastal fisher hunters and inland reindeer herders shared the landscape with incoming agriculturalists and were often assimilated or marginalised. While inside their settled areas there is a palaeoecological record for the Sámi, their footprint on the landscape is often slight and difficult to discern. The diverse nature of the activities of the Sami, and their slight signal on the landscape makes the task of firmly identifying human impact based on the palaeoecological record outside of settlements a more complex story. Skjaervika on the island of Kvaløya is one of the few Sami sites where from we have information about their ecological signal in relation to their surrounding environments. From site S30 at Skjaervika, there is a fossil insect record beginning ca. 1800 BC which spans over 2000 years, from the younger Stone Age to the Younger Iron Age. Taking into account pollen evidence, the results from the insects suggest a more shaded birch willow scrub environment near the site, which is no longer present. Charcoal records in relation to the palaeoecological data indicate periodic activities which involved landscape clearance, perhaps using fire. Dung beetles may relate to reindeer on the island. As part of the assemblages, insect taxa which are largely synanthropic and associated with mould and carrion recovered from the promontory, from which the site has wide vistas across the sea to nearby islands, provide evidence for the presence of meat, perhaps as offerings, as opposed to evidence for food storage or preparation.

2 MICROARCHAEOLOGY OF ANIMAL FIBERS IN MESOLITHIC RED OCHRE GRAVES IN NORTHERN EUROPE – AMI PROJECT OF HUMAN-ANIMAL INTERACTIONS AND IDENTITIES

**Abstract author(s):** Kirkinen, Tuija (Department of Cultures, University of Helsinki) - Mannerman, Kristiina (Department of Cultures, University of Helsinki; Archaeology Department, University of Tartu)

**Abstract format:** Oral

Perishable organic materials such as skin, fur and feathers are mostly invisible in Mesolithic burials. However, we can safely assume that costumes or accessories may have been made of furs, pelts, feathers, wings, or fibres, and the body may have been wrapped in skins. The furnishing of graves with animal pelts, or using feathered clothing and accessories, may have had a metaphorical meaning related to social relations, such as changing skins in death to mean changing identities.

In the ERC funded project Animals Make Identities. The Social Bioarchaeology of Late Mesolithic and Early Neolithic Cemeteries in North-East Europe (AMI), we are testing the microarchaeological analysis of soil samples from Mesolithic burials to identify fibres, such as hair and feathers. Animal hairs and feathers are made of keratin, which is prone to bacterial and fungal decomposition. However, in favourable environments hairs and fur can be preserved for centuries. The preliminary results are promising, and bird feathers and animal hairs have been found in Mesolithic burials at Donkalis, Lithuania, Yuzhniy Oleniy Ostrov, Russia, and in Majoon-suo, Finland.

3 PLANTS IN THE EVERYDAY DIET OF THE EARLY BRONZE AGE I SETTLEMENT AT ARSLANTEPE, TURKEY

**Abstract author(s):** Sabanov, Amalia (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Masi, Alesia - Vignola, Cristiano (Department of Environmental Biology, Sapienza University of Rome; Max Planck Institute for the Science of Human History, Jena) - Sadori, Laura (Department of Environmental Biology, Sapienza University of Rome)

**Abstract format:** Oral

Through the investigation of plant macro-remains recovered from different contexts connected to storage, plant processing and consumption, the diet of prehistoric communities can be meticulously investigated. The numerous charred remains recovered from such contexts from the Early Bronze Age I settlement of Arslantepe (3000-2800 cal. BCE) give strong evidence pointing to a subsistence pattern greatly relying on agriculture. The biggest share of the plant component in the diet of Arslantepe’s inhabitants goes to cereals of which the most dominant is barley, followed by emmer and einkorn. Less numerous but still greatly present in the archaeobotanical assemblage are legumes, represented by peas, chickpeas, and vetches. Apart from many cultivated plants, some wild species were also collected and consumed at the settlement. Most of them belong to the rose family. In Arslantepe all the crops were thoroughly cleaned before storing which means that there was no need for conducting such activities on a daily basis before food preparation. For preparing meals they used grinding stones, mortars and pots, and for thermal processing, they used open hearths and ovens. Due to circumstances that created favorable conditions for the preservation of plant remains, a fire seizing the entire village, a lot of information was retained, giving invaluable data about the diet and the day-to-day activities of the Early Bronze Age communities in the Near East.

4 UNRAVELLING THE FUNERARY RITUAL: EARLY IRON AGE MINERALIZED TEXTILE REMAINS FROM TUMULUS 6 AT KAPTOL IN CROATIA

**Abstract author(s):** Fileš Kramberger, Julia - Potrebica, Hrvoje (Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb)

**Abstract format:** Oral

Textile, as an object made of organic material, is rarely found on archaeological sites because of its quick deterioration. Under right circumstances, textile can be recovered and give valuable insights into the lives of past peoples. By analyzing pictorial representations, textile remains and impressions or textile production tools, it is not only possible to determine the production process and the technical aspects of fabrics used in a certain period, but their function as well, depending on the find context.

From a wide variety of sites, it is quite clear that in the Central and South-eastern European Early Iron Age textile served not only as clothing, but also for insulation, furnishings, everyday useful objects, etc. In addition, some valuable grave finds have confirmed that textiles also had an important role in the funerary ritual, where they customarily served as special, funerary clothing or shrouds and furnishings, but also as recipients for grave goods and cremated remains.

By analyzing metal finds from the princely grave in Tumulus 6 at Kaptol in Croatia, several small fragments of mineralized textile were found attached to certain iron artifacts mostly associated with horse gear. Using digital microscopy, they were identified as small pieces of twill fabrics. As the horse gear does not constitute a part of the deceased’ dress, the textile attached to it probably originates from a textile shroud or pouch encasing grave goods. Since this tumulus is deemed one of the richest on the necropolis of Gradca at Kaptol, based on the large number of elite grave goods placed inside it, it does not seem unusual that it might have been filled with high quality perishable goods, as well. As being part of the funerary ritual, the fabrics inside the tumulus had a representative effect, as well as a protective and decorative function.

5 THE NEED FOR PSYCHOACTIVE DRUG RESIDUE IDENTIFICATION TO SPECIFY THE PRIMARY FUNCTION OF THE PRE-HISPANIC STIRRUP SPOUT BOTTLE

**Abstract author(s):** Wilke, Detlef (Dr. Wilke Management & Consulting GmbH) - De Smet, Peter (-)

**Abstract format:** Oral

In pre-industrial, small-scale societies ritual performances are thought to have had a particular importance in managing the religious-cosmological welfare of the individual and the group. Ritual practice may include specific attires as well as respective paraphernalia, which however are difficult to be identified as such in the archaeological record. From the Peruvian north coast over a period of almost three millennia a strange looking vessel type is known, the stirrup spout bottle, whereby its primary or practical use function is still unknown. Ethnographic analogy, scenic-figurative context information as well as the analytical proof of hallucinogenic drugs in pre-Hispanic funerary contexts suggest, that this bottle type may have served as container and administering device for potent liquids supporting drug-induced states of trance and divination in ritual performances (1). However, there is so far no experimental proof of candidate psychoactive alkaloids and heterocyclic degradation products of regional botanical species like



Echinopsis [Trichocereus] pachanoi, Anadenanthera or Nicotiana as internal vessel residues, which may have been left over from potions destined for oral or nasal ingestion. At least an occasional, exemplary identification of such organic residues may clarify the primary role of this archaeologically and culture historically most significant ceramic find category.

6 **COMBINING MOLECULAR AND ARCHAEOLOGICAL ANALYSES ON BIOARCHAEOLOGICAL REMAINS: THE CASE-STUDY OF PASTENA CAVE, A PROTOHISTORIC ITALIAN RITUAL SITE**

**Abstract author(s):** Cortese, Francesca (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata) - Silvestri, Letizia (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata; Durham University, Department of Archaeology) - De Angelis, Flavio - Romboni, Marco - Rickards, Olga (Centre of Molecular Anthropology for Ancient DNA Studies. University of Rome Tor Vergata) - Rolfo, Mario (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata)

**Abstract format:** Oral

Archaeological and molecular analyses on bioarchaeological materials are key factors for reconstructing social and subsistence human habits.

The aim of this paper is to investigate the subsistence strategy and ritual practices of Bronze Age individuals buried in Pastena Cave in Central Italy. This case-study stands out for the complexity of its stratigraphic deposit and the huge amount of carpological materials, comprising of thousands of burnt seeds - mostly legumes and cereals - followed by faunal remains - mainly domestics - and human bones - particularly juveniles. Noteworthy, the rituality of the cave is especially indicated by the exceptionally numerous burnt seeds, the scattered human bones, the depositional features of the artefacts, and the repeated, structured depositions of all the above-mentioned materials.

Carbon and nitrogen stable isotope analyses have been applied to each category of bioarchaeological remains, not only for the well-established purpose of human diet reconstruction, but also to shed light on breeding practices and seeds cultivation.

Preliminary analyses allowed us to hypothesize a human diet mainly based on terrestrial plants rather than animal proteins, where plants were likely manured and watered to guarantee yield magnification. Although plants appear to be cultivated for human consumption, the human isotope values do not seem to be consistent with such a large amount of legumes - which may be linked to the funerary environment. The combination of all these elements leads to speculate on a ritual crop deposition in the cave.

Further interdisciplinary studies are still ongoing to support the obtained results and to broaden the knowledge about the ritual practices performed in this cave.

7 **COMBINING DENTOALVEOLAR AND STABLE ISOTOPE ANALYSIS FOR DIET RECONSTRUCTION OF ARCHAEOLOGICAL POPULATION FROM BIJELA, CROATIA**

**Abstract author(s):** Bedic, Željka (Croatian Academy of Sciences and Arts) - Janeš, Andrej (Croatian Conservation Institute)

**Abstract format:** Oral

The Benedictine monastery of St Margaret is situated in Bijela near Daruvar in north-eastern Croatia. In eight systematic archaeological excavation campaigns conducted from 2012 to 2019 a part of the single – nave monastery church was uncovered revealing numerous architectural elements, some small finds, and 28 graves. According to radiocarbon analyses of 14 skeletons the burials were dated from 13/14th to 17th century.

Anthropological analysis carried out on osteological material showed high frequencies of certain dentoalveolar pathologies (11% of caries, 15.4% of alveolar disease) which is significantly higher in comparison to contemporaneous sites in the region. These values suggest high carbohydrate and low protein diet. The obtained results will be compared to carbon and nitrogen stable isotope analyses performed on 14 skeletons in order to get more clear insight into dietary habits of this archaeological population. Also, the analyses between sexes and social groups inside the population will be conducted to see if there was a different food consumption pattern among specific groups.

8 **CORRELATIONS IN HUMAN SUBSISTENCE PATTERNS OF THE COASTAL AND RIVERINE EUROPEAN POPULATIONS FROM THE MESOLITHIC TO THE EARLY BRONZE AGE**

**Abstract author(s):** Nikitin, Alexey (Grand Valley State University) - Lillie, Malcolm - Budd, Chelsea (Umea University) - Elliot, Emily (Grand Valley State University) - Potekhina, Inna (Institute of Archaeology)

**Abstract format:** Oral

Human populations living in coastal and riverine regions have access to a variety of subsistence resources. We examine subsistence patterns, inferred through the analysis of stable isotopes of carbon (13C) and nitrogen (15N) from dentin and bone collagen, of prehistoric human populations from the Baltic and northern Black Sea (North Pontic Region, NPR) areas as well as along major European rivers, and find correlations in dietary preferences across space and time transects. For instance, the Meso-Neolithic HG populations from the Baltic region show a similar pattern of subsistence to the Meso-Neolithic HG populations from the riverine Dnieper Rapids area in eastern NPR. On the other hand, the riverine HG Meso-Neolithic populations of the Iron Gates of the Danube show reliance on similar food resources to the presumably semi-nomadic Eneolithic populations of western NPR. We also observe a shift towards less depleted 13C in the late-Eneolithic-Early Bronze Age riverine farming and nomadic populations of the forest-steppe areas adjacent to western NPR. Among other possibilities, this shift may indicate the increased reliance on plants utilizing the C4

carbon fixation pathway and/or protein coming from animals consuming C4 plants.

9 **THE FIRST MUSLIMS IN SANTARÉM: AN ISOTOPIC INVESTIGATION OF DIET IN ISLAMIC MEDIEVAL PORTUGAL**

**Abstract author(s):** MacRoberts, Rebecca (HERCULES laboratory- University of Evora) - Teixeira, João (University of Adelaide) - Liberato, Marco (Centro de Estudos de Arqueologia, Artes e Ciências de Património) - Valente, Maria João (Faculty of Human and Social Sciences, University of Algarve) - Relvado, Claudia (Research Centre for Anthropology and Health - CIAS, University of Coimbra) - Barrocas Dias, Cristina (School of Technology Sciences, Department of Chemistry, University of Évora; HERCULES Laboratory, University of Évora) - Fernandes, Teresa (Research Centre for Anthropology and Health - CIAS, University of Coimbra; School of Technology Sciences, Department of Biology, University of Évora) - Barros, Filomena - Vasconcelos Vilar, Herminia (School of Social Sciences- CIDEHUS, University of Évora) - Maurer, Anne-France (HERCULES Laboratory, University of Évora)

**Abstract format:** Oral

The Islamic control of Iberia during the 8th- 13th centuries brought about significant changes in agricultural practices and culturally driven food choices. The innovation of irrigation techniques in the Islamic Period allowed for the introduction of many crops that previously could not grow in the Peninsula. The site of Avenida 5 de Outubro, Santarém, Portugal, contained a necropolis, which due to its location on the periphery of the Alcáçova, appears to contain the remains of the earliest Islamic population to occupy the conquered city in the 8th/9th century. This is potentially supported by the anthropological features of some of the excavated skeletons, which are generally tall and robust and display prognathism consistent with individuals of African origin, indicating that they could belong to the initial conquering population of Berbers. 30 skeletons from this necropolis were selected for the analysis of stable carbon, nitrogen and sulphur isotopes in their bone collagen in order to reconstruct the dietary practices of this population through their plant choices and protein consumption. Faunal bone collagen was also measured to establish a dietary baseline. Additionally, mtDNA was analysed for six skeletons, with and without prognathism. The results obtained provide evidence of the dietary choices of this population, which are thought to relate to religious and cultural practices, as well as their adaptation to the Iberian environment post-conquest. This research is part of the project “TRANSCULTURAL (POCI-01-0145-FEDER-031599)” and represents one of only a handful of such studies in Medieval Portugal, and the first on an apparent population of early Islamic conquerors.

10 **NEW WORLDS FOR ANCIENT WORLDS**

**Abstract author(s):** Antonino, Riccardo (Robin Studio - Politecnico di Torino (DAUIN)) - Quaranta, Gianfranco (Area-3)

**Abstract format:** Oral

How can technologies and scientific data interact in order to create and promote research projects through exhibitions?

This dissertation will explore the role of experience design when its focus is on making research accessible to an audience, specifically on how to treat DICOM data and CT-scans of mummies in order to make these understandable by the public. The work of Robin Studio, together with IMA Solutions, in crafting multimedia and graphic content of the temporary exhibition “Invisible Archaeology” at Museo Egizio in Turin, is presented as a case-history.

Modern archeometry techniques were used as a base for the creation of multimedia and interactive content. Volumetric data handling techniques with film-industry standard software are further analyzed as a way to convey scientific accuracy and overcome modern-day audiences visual bias.

The content creation follows a specific design method involving a bridge figure between the museum curators and research technicians on the one side and visual artists and the audience on the other.

Videos, texts and graphics are organized with a loop narrative method and developed with the use of a specific visual “leit motiv”.

Parallel work pipelines allow the content creation team to adhere to a strict timeline, thus being compatible with the timing of the research projects which need to be exhibited.

a. **EXPERIMENTAL RESEARCH ON THE DIET OF ANCIENT SOCIETIES**

**Abstract author(s):** Zdeb, Katarzyna (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw)

**Abstract format:** Poster

The results of experimental tests during which clay vessels were made manually will be presented. Then selected products were cooked in these ceramics vessels. Various dishes were prepared in the dishes: pork and beef, fish and milk. The vessels were subjected to chemical analyzes in order to reproduce their contents. For chemical analyzes, compressed gas chromatography with mass spectrometry and stable carbon isotope analysis were used.

First, qualitative and quantitative content of fatty acids from each sample was used to interpret the results. After their analysis, additional isotope tests were performed to refine the results. The peaks obtained were then compared to the true content of the pottery.

The results of the experiments can be applied to ceramics from archaeological excavation and to acquire knowledge about types of food, diet and economy. The information obtained allows you to search for analogies in the results from prehistoric and early medieval pottery.

b. GRINDING STONES AS A UNIVERSAL KITCHEN BOARDS OF THE LATE BRONZE AGE

**Abstract author(s):** Šálková, Tereza (Institute of Archaeology, Faculty of Arts, University of South Bohemia in České Budějovice; Laboratory of Archaeobotany and Paleoecology, Faculty of Science, University of South Bohemia in České Budějovice) - Budilová, Kristýna - Kovárník, Jaromír (Laboratory of Archaeobotany and Paleoecology, Faculty of Science, University of South Bohemia in České Budějovice) - Koník, Peter (Department of Molecular Biology, Faculty of Science, University of South Bohemia in České Budějovice) - Pavelka, Jaroslav (Faculty of Education, University of West Bohemia) - Chvojka, Ondřej (Institute of Archaeology, Faculty of Arts, University of South Bohemia in České Budějovice) - Kuna, Martin (Institute of Archaeology of the CAS, Prague) - Menšík, Petr (Department of Archaeology, Faculty of Arts, University of West Bohemia)

**Abstract format:** Poster

It was assumed that the grinding stones were used generally for processing of cereals. Analysis of sediment from the surface of the grinding stones from the Late Bronze Age site Březnice (South Bohemia, Czech Republic) demonstrated that on the grinding stones different organic materials were crushed. The archaeobotanical analysis of starch grains and phytoliths was carried out. The presence of meat (pork, beef, and poultry), eggs, milk and grain was tested using food antibody tests, but only some of them with positive results. Protein mass spectrometry did not positive results. Crushing of Poaceae and Fabaceae was confirmed based on presence of their starch and phytoliths. Grains (wheat/ barley/rye) and meat (pork, beef and poultry) were confirmed by food antibody tests.

The reference collections of plant macroremains was obtained from the infill of settlement features. Archaeozoological material was not preserved due to acid soils. The spectra of crops used in the settlement are known, while the species of domesticated animals are reconstructed only based on comparison with other sites. The nature environment of the hinterland of the settlement from which they drew wild resources was also reconstructed, based on the macroremains analysis.

The comparison of the results from the surfaces of the grinding stones and from the sediment of the settlement features allows the partial reconstruction of dietary and kitchen practices of the Late Bronze Age people in the region of Central Europe, and to consider the grinding stones as a kind of multifunctional object.

c. VALUING ANIMAL REMAINS FOR RECONSTRUCTION OF HUMAN DIET IN THE BRONZE AGE COMMUNITY OF ȘOIMUȘ-TELEGHI (ROMANIA)

**Abstract author(s):** Malaxa, Daniel (Faculty of Biology, Alexandru Ioan Cuza University of Iași) - Tudor, Marc (Dacian and Roman Civilisation Museum, Deva) - Stanc, Simina (Faculty of Biology, Alexandru Ioan Cuza University of Iași) - Bejenaru, Luminița (Faculty of Biology, Alexandru Ioan Cuza University of Iași; Romanian Academy – Iași Branch, “Olga Necrasov” Center of Anthropological Research)

**Abstract format:** Poster

During the archaeological research conducted on the Șoimuș-Teleghi site (Hunedoara County, Romania), in 2011, a large number of complexes were identified (i.e. houses, pits with different destinations, ovens, ditches, ritual deposits, graves), belonging to the Neolithic, middle and late Bronze Age, and also to Iron Age and Late Antiquity.

The present study, based on the faunal remains recovered from the Bronze Age complexes, evaluates the animal resources in human diet, in terms of palaeoeconomy (i.e. animal husbandry, hunting, fishing and mollusk gathering).

Animal husbandry had the most important role: almost 64% of the remains are of domestic mammals: cattle (*Bos taurus*), sheep/goat (*Ovis aries*/*Capra hircus*), pig (*Sus domesticus*), horse (*Equus caballus*), dog (*Canis familiaris*). The hunt was focused on large and medium size mammals, which provided an important quantity of meat and other products such as skin, bones, antlers: red deer (*Cervus elaphus*), aurochs (*Bos primigenius*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), wolf (*Canis lupus*), bear (*Ursus arctos*), hare (*Lepus europaeus*), beaver (*Castor fiber*) and badger (*Meles meles*).

The remains of fish and freshwater mussel (*Unio* sp.) indicate that this community also exploits the aquatic environment for purchasing food.

d. ANALYSIS OF RITUAL CONTEXTS AND EXCAVATION PLANNING THROUGH GPR (GROUND PENETRATING RADAR) AT EL TRAPICHE PRECLASSIC PERIOD SITE, EL SALVADOR

**Abstract author(s):** Flores Manzano, Carlos (ARCHMAT) - Ito, Nobuyuki (Nagoya University) - Fukaya, Misaki (Kyoto Foreign Studies University) - Aiba, Nobuhiko (Nagoya University)

**Abstract format:** Poster

El Trapiche is an archaeological site located in Chalchuapa (El Salvador), its importance is related with the early political and ritual activities identified in the southern Mesoamerican frontier, and it started in the Preclassic Period (circa 2500 b.C.-200 a.D.) with the development and continuous use of the area for around 3000 years. During the last nine years, systematic investigations have been done in the area aiming towards the understanding of socio cultural dynamics in the transition between Olmec and Mayan cultures.

The methodology used to design the project it has been through GPR Ground Penetrating Radar in order to ID and map the structures in the southern part of the mounds E3-1 (main one), E3-2, E3-3, E3-4, E3-6 and surrounding areas. With the purpose of socialize the results obtained in the research at El Trapiche mound groups, the present study allows to recognize several architectural features,

ceramic, figurines, sculptures and stelae related to different rituals from the Preclassic Period. Notwithstanding that it has been difficult to obtain organic materials, enough to create AMS dating, it has been identified crops in the surrounding areas (possibly maize), dated to the end of Late Preclassic Period under Ilopango volcano ash; the results obtained suggests that El Trapiche cultural materials, specially stelae, sculptures and figurines might have been related with a ritual space on the early development of this area, associated with the underworld, based on the interpretation of different contexts. This also suggest a connection with other early sites in Mesoamerica, like Tres Zapotes, Chiapa de Corzo (Mexico) and El Baul (Guatemala). The suggestion of an early chronology for El Trapiche may be crucial to understand the consolidation of maya culture in the Southern Mesoamerican frontier.

43 LIFE AND LORE IN THE LATE IRON AGE (C. 550-1050 AD) NORTH

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Ilves, Kristin (University of Helsinki) - Hillerdal, Charlotta (University of Aberdeen)

**Format:** Regular session

Over the last two decades of archaeological explorations, theoretical vanguards, and the introduction of new methodological strategies, together with a growing amount of critical studies in archaeology taking their stance from a multidisciplinary perspective, have dramatically changed our understanding of Northern Iron Age societies. One example being the recognition of the profound effect of 6th century AD climatic events on the emerging, collapsing and surviving networks visible from the archaeological, biocultural and paleoclimatic records. Other recent examples of such landwinnings are found in the reintegration of written sources and archaeological material, genetic and isotopic studies entirely reinterpreting previously excavated grave material, and emerging understanding of the varied nature of cross-cultural contacts.

The aim of this session is to provide an intense and cohesive focus on the characteristics of contemporary Late Iron Age research in Scandinavia and northern Europe.

We welcome contributions:

- presenting up-to-date insights from field projects facilitating more comprehensive understanding of large-scale networks characteristic for the period
- providing new daring insights and ways of interpreting settlement dynamics by exploring and re-evaluating already existing material
- exploring the significance of the written word existing in the intermedium between Iron Age and a text based medieval society
- discussing different levels of interaction; between cultures, and over time, including the academic and public impact of our current understanding of the period in question.

We invite scientific contributions as well as more speculative thoughts pushing the field forward from their expected outcomes and inspiring to the creation of new knowledge. We also encourage contributions related to a renewed interaction between academia and the ever-growing field of infrastructural archaeology, by integrating cutting edge fieldwork and developing field methods in the corpus of Iron Age and Early Medieval studies.

ABSTRACTS

1 OUTLANDERS RESOURCE EXPLOITATION, PRODUCTION AND NETWORKS IN PRE-VIKING AGE SWEDEN

**Abstract author(s):** Hennius, Andreas (Uppsala University)

**Abstract format:** Oral

The middle of the Iron Age (around AD 350-650) was a period of comprehensive societal change in Sweden, which served to transform many aspects of society and set the stage for further development during the Viking Age. To date, the focus of research has been on changes taking place within the southern and central Swedish agricultural regions. During the period, one of the largest settlement re-organisations prior to the 19th century took place, including new burial traditions, the building of large scale monuments, a marked increased social stratification and militarisation, as well as increased amounts of imports from northern Scandinavia, the European continent, and beyond. Much less discussion has been accorded to the impacts of these changes on a wider landscape, in the boreal forests and coastal zones.

As part of my (nearly finished) PhD research, I have sought to generate a more profound knowledge of societal changes during the period through a study of development outside the infield areas of the agrarian based settlements what is sometimes called the outlands. By studying production sites in the outlands, as well as raw materials and artefacts found at the settlements, a picture of a flexible and multi-faceted land-use emerges, with un-cultivated production and resource exploitation already playing an important role in regional economies by the middle of the Iron Age. In this paper I will give a short presentation of this work.

2	<p><b>A TALE OF THREE TUNA-SITES – A CLASSIC SCHOLARLY PROBLEM ENLIGHTENED BY NEW ARCHAEOLOGICAL MATERIAL</b></p> <p><b>Abstract author(s):</b> Sundkvist, Anneli (Societas Archaeologica Upsaliensis) - Eklund, Susanna (Societas Archaeologica Upsaliensis)</p> <p><b>Abstract format:</b> Oral</p> <p>The meaning and social role of so-called “Tuna-places” has long eluded scholars. Many high-status archaeological sites, such as boat-grave cemeteries and “ting”-mounds, are connected to a Tuna-name, a place name very common in Central Sweden, but the question of their significance in Iron Age society remains unanswered. A century of academic discussion has resulted in broad consensus in defining the word itself as “enclosure”, but, despite consensus on the etymology, it has brought us no closer to a clear understanding of the Tuna-sites from an archaeological perspective. Archaeologically, they belong in the Iron Age, even though some have older roots and others remain important well into the Middle Ages.</p> <p>For a long time, the archaeological excavations carried out at Tuna-sites were research excavations, limited in size and resources. However, during the past two decades, several Tuna-sites have been excavated through contract archaeology. This has resulted in the opening of larger areas for excavation and the possibility of detailed archaeological analyses using several sources of evidence. In this chapter, we will focus on three newly excavated sites: Ultuna – a site including graves and votive finds of exquisite quality; Giltuna – a fenced farm with long continuity; and Tortuna – a site with two generations of cult buildings on a settlement. These sites are discussed in relation to other Tuna-sites, and their interpretation is an attempt to study the Tuna-sites in a broader landscape context.</p>
3	<p><b>MEASURING MONUMENTS – VOLUMETRIC CALCULATIONS OF THE GREAT MOUNDS IN UPPSALA</b></p> <p><b>Abstract author(s):</b> Lowenborg, Daniel - Ljungkvist, John (Uppsala University)</p> <p><b>Abstract format:</b> Oral</p> <p>Uppsala has one of the most significant Late Iron Age sites of Central Sweden, and the three great mounds there is a signature feature of the region. The size of the mounds keep making an impressive impact on visitors today, and represent a demonstration of power and control. The three main mounds are situated on top of a natural ridge to give them an extra sense of size and monumentally over the surrounding landscape. It has also be argued that the top of the ridge has been cut away on the sides of the mounds to make them even more impressive. This situation has made it difficult to make reliable measurements of the volume of the mounds, since the underlying ground surface is difficult to estimate. Previous attempts have been based on estimates of the height and radius, and the results vary dramatically between studies.</p> <p>This paper will present a new attempt at volumetric calculation that is based on a high-resolution elevation model, created with photogrammetry using a drone, and a digital reconstruction of the underlying ridge. This makes it possible to calculate the volume in square meters in 3D GIS as a difference between the two surfaces. The result suggests that the three mounds are more similar in size compared to previous estimates. Comparison with other great mounds in the region is also possible with this method, and can inform a discussion about the necessary labour required for the construction of these monuments, and the social context of these symbols of power in the landscape.</p>
4	<p><b>CROSS-CULTURAL INTERACTION; A MULTIDISCIPLINARY APPROACH IDENTIFYING MOBILITY THROUGH LATE IRON AGE/VIKING AGE BURIALS LOCATED IN INLAND AND COASTAL NORWAY</b></p> <p><b>Abstract author(s):</b> Strand, Lisa (NTNU)</p> <p><b>Abstract format:</b> Oral</p> <p>Archaeological material has been used to identify broad social networks, connecting Norway to the wider world during the Late Iron Age/Viking Age period. However, information of who the people, constituting the web of public network during this time period were, are not that known in the current archaeological research from Norway.</p> <p>In order to investigate mobility and to discuss the society in which people lived within during this time period, 35 Late Iron Age and Viking Age burials, located inland and in coastal areas are studied. The burials are diverse, both in biological gender, age and with the archaeological material which was found in each context.</p> <p>Applying multidisciplinary research methods, such as osteology and oxygen isotopic studies together with archaeological theory and methods increases the research opportunities to answer questions of the identification of underlying patterns in the Late Iron Age / Viking Age, and enhance the possibility to identify common denominators for such.</p> <p>However, if there are not any significant traits common for these 35 individuals, how can this information benefit and further Late Iron Age / Viking Age research of cross-cultural interaction in the North?</p>
5	<p><b>DREAM-HOUSES OF THE LATE IRON AND VIKING AGES: THE HOUSE AND THE SELF</b></p> <p><b>Abstract author(s):</b> Eriksen, Marianne Hem (Museum of Cultural History, University of Oslo)</p> <p><b>Abstract format:</b> Oral</p> <p>The objective of this paper is to explore the connection between the house and the self in Late Iron Age Scandinavia. Houses tran-</p>

6	<p>scend the opposition of material and inner worlds — they are social entities and mechanisms that form part of peoples’ life projects in intimate and interwoven ways. This chapter will explore how houses were dreamed in the Late Iron Age. Psychoanalysts have claimed since the days of Freud that houses have a particular significance in the sub-conscience of the inhabitants of modernism. But what do we know of houses and dreams in the past, such as in the Late Iron Age? Drawing on the field of dream anthropology, and combining Norse literature with archaeological evidence, this paper explores how the protagonists of the sagas dreamed of longhouses and architectural spaces. By combining these narratives with the material evidence of lived space in the archaeological record, the talk explores the intimate link between the house, personhood, and the self.</p> <p><b>STICKY STRUCTURES AND OPPORTUNISTIC BUILDERS – LONGHOUSES IN NORTHERN NORWAY</b></p> <p><b>Abstract author(s):</b> Spangen, Marte - Arntzen, Johan (UiT - The Arctic University of Norway)</p> <p><b>Abstract format:</b> Oral</p> <p>The longhouse has been a turning point for research on prehistoric farming societies in Scandinavia for several decades. Yet, no comprehensive study has been made of this house type and its context, variations and social implications in the Far North. In this paper, we present the currently available longhouse material within the three northernmost counties of Norway. The 50 longhouses that have been excavated within the administrative district of Tromsø University Museum are discussed in more detail. Our survey shows both similarities to and some intriguing variations from the longhouses in other areas of Norway and the rest of Scandinavia, concerning the chronology of various house types, building details and farm layout. These aspects are related to the particularities of the environmental, cultural and socio-political context in the north. The results are preliminary but the paper provides a starting point for further investigations. These should include more excavations employing current methodologies such as mechanical top-soil stripping to ensure representative data.</p>
7	<p><b>NEGOTIATING NARRATIVES. AN EMIC PERSPECTIVE ON NORSE REUSE OF ANCIENT MONUMENTS IN THE SCOTTISH ISLES</b></p> <p><b>Abstract author(s):</b> Hillerdal, Charlotta (Department of Archaeology, University of Aberdeen)</p> <p><b>Abstract format:</b> Oral</p> <p>The practice of repopulating ancient burial grounds is something the Viking Age Norse settlers brought with them when they shaped their new environments on the Scottish Isles in the 9th century. In the context of colonization, this can be understood as a way of legitimizing presence, linking to existing traditions and inscribing your own history on a foreign landscape – evidenced as a material reinterpretation of the past. Thus, it has been argued, the Norse manipulated the Scottish landscape to forge for themselves a place in history. However, such a secular interpretation of Norse interactions with their landscape disregards the animistic mindset of the Norse belief system, and it fails to take into consideration the very nature of Viking Age archaeological remains on Orkney.</p> <p>Here I argue that the burials function as active mnemonic nodal points in a sentient narrative landscape – where practice links present to past and creates memory for the future. If we allow for an emic perspective on Norse interactions in Scotland, these practices appear not so much a manipulation of landscape as an active negotiation of place with foreign entities – past and present. The focus of my discussion is the Westness burial ground on Rousay, Orkney.</p>
8	<p><b>SEARCHING FOR A SCOTTISH-NORSE IDENTITY IN THE EARLY VIKING AGE</b></p> <p><b>Abstract author(s):</b> Manavian, Sara (University of Aberdeen)</p> <p><b>Abstract format:</b> Oral</p> <p>The nature of Scandinavian settlement throughout Scotland during the Viking Age has long been a topic of enquiry for archaeologists yet remains largely under-analysed. Striking differences between the northernmost regions of these islands and the rest of what is now Great Britain and Ireland have been noted; a complete dearth of urban settlement as well as a much higher ratio of furnished female burials. But the impact of this information on our understanding of a cultural identity unique to this region has been left undiscussed. Limited evidence from the Western Isles has often been cited as one reason our understanding of the early Viking Age in Scotland has been somewhat incomplete. However, with the publication of cites such as Cille Pheadair and Bornais, a better understanding of the Scandinavian presence during this period is emerging.</p> <p>Ideas of a Hiberno-Norse identity are widely accepted, but the existence of a Scottish-Norse identity remains speculative. This research is an attempt to draw together evidence from Viking Age settlements and burials across Scotland in order to identify the creation and existence of a unique cultural identity relevant to the Scandinavian settlers in the Northern and Western Isles. It will also draw upon evidence from late Iron Age Scandinavia (Norway in particular) in order to follow continuities where applicable. Furthermore, it takes a closer look at the nature of settlement in Shetland, Orkney, and The Hebrides, comparing the archaeological evidence from these regions rather than treating Scotland as one homogenous cultural epicentre. Tracing the differences across the islands is key to understanding the development and nature of the Scandinavian identity in Scotland during the early Viking Age.</p>



9	<p><b>SYMBOLS IN ACTION: REANALYZING BROOCHES IN VIKING AGE BURIALS</b></p> <p><b>Abstract author(s):</b> Cartwright, Rachel (University of Minnesota)</p> <p><b>Abstract format:</b> Oral</p> <p>Although they serve a functional purpose, brooches are often used and interpreted as a means of messaging. Present-day political figures such as Madeleine Albright provide explicit modern day examples of the use of brooches in sending such messages. In analyzing instances of this in the past, it has been suggested that brooches were often used to communicate a person’s identity, whether that be about status, gender or group affiliation. For example the oval brooches prevalent in Viking Age female dress have long been interpreted in such a way, with their presence in a burial indicating a Norse identity and probable high status. While oval brooches are one of the most common types found in Viking Age graves, the variation in quality and quantity within burials, as well as other accompanying items of personal ornamentation, indicates that they likely held significant meaning. This paper will use semiotics as a way of interpreting the signals being emitted by the brooches found in Viking Age burials. Not only will their meaning in the past be discussed, but also their interpretations in the present.</p>
10	<p><b>NETWORKS OF THE VIKING-AGE SLAVE TRADE IN ARCHAEOLOGY AND TEXT</b></p> <p><b>Abstract author(s):</b> Delvaux, Matthew (Boston College)</p> <p><b>Abstract format:</b> Oral</p> <p>Large-scale networks developed between Scandinavia and the Near East during the Late Iron Age, emerging and intensifying between 700 and 900 CE. These networks brought small artifacts of glass, stone, and silver into Scandinavia. According to textual sources, they also carried large numbers of slaves in the opposite direction. This slave trade poses particular problems for archaeological research. To what extent did the slave trade to and through Scandinavia leave an archaeological trace? Can impacts of the slave trade be seen in Viking-Age cemeteries and graves, settlements and structures, or across regional landscapes? Should archaeologists restrict their discussions of slavery to situations in which slave presence can be confirmed, or should they consider ways in which slavery and the slave trade indirectly shaped societies at different levels of interaction?</p> <p>In this paper, I offer an approach for studying the slave trade through a combination of textual indicators and material markers. Patterns in textual accounts of the early Viking-Age slave trade correspond to patterns in the archaeological record. These patterns challenge archaeologists to give increased attention to roles that slaves played in creating the archaeological record—through their value as local and long-distance trade goods, through their potential for resistance or flight from slave markets, through their unwilling presence on ships and along maritime routes. Scholarly consensus affirms that the movement of slaves played a significant role in long-distance communications and connections. Archaeological interpretations should reflect this as well.</p>
11	<p><b>REAL OR IMAGINARY BREAK IN SETTLEMENT CONTINUITY OF THE 11TH CENTURY ÅLAND ISLANDS</b></p> <p><b>Abstract author(s):</b> Ilves, Kristin (University of Helsinki)</p> <p><b>Abstract format:</b> Oral</p> <p>Rapid and complete abandonment of previously permanently populated – often, vast areas – is not uncommon in the history of the human past; depopulation is especially characteristic to islands. In addition to the well-known case of Easter Island, whereat over-exploitation of its resources as well as slave raiding have been suggested as a cause, many Greek islands in the Mediterranean were completely or almost completely deserted for certain periods due pirate attacks in the 15th and 16th centuries to be resettled shortly after. Depopulation might strike islands also due to infectious diseases, as happened in French Polynesia during the 19th century. Depopulation of an island could also be a political decision. For example, in the middle of the 19th century, the former Dutch island of Schokland was evacuated due to the coastal erosion threat; and in the 1930s the government evacuated the few remaining people living on St. Kilda, a remote Scottish island, as the island population was not considered viable anymore. In my presentation, I address the theories of depopulation of the Åland Islands in the Baltic Sea. There is an understanding that Åland, having had a dense population during Late Iron Age, was very quickly depopulated in the early 11th century, and about 150 years later, there was a rapid re-colonization of the archipelago. Hypotheses about a break in settlement continuity have been built mainly on a fact that virtually no prehistoric place names have been survived on the islands, which has been considered as a sign that Åland was deserted for so long that no living memory of the names was left. I aim to bring archaeological evidence into the discussion in order to advance the debate with an up-to-date field data providing new insights to this issue.</p>
12	<p><b>A FAITH IN-BETWEEN. THE MERGING OF CHRISTIAN AND PRE-CHRISTIAN IDEAS DURING THE CONVERSION OF VIKING AGE SCANDINAVIA</b></p> <p><b>Abstract author(s):</b> Therus, Jhonny (Uppsala University, Dep. Archaeology and Ancient History; Kalmar County Museum)</p> <p><b>Abstract format:</b> Oral</p> <p>This paper will show how the Christian Gospel was adapted to its Germanic audience as it spread into the Scandinavian countries during the Viking Age. It will use Eastern Sweden during the 10th and 11th century as a case study.</p> <p>The study triangulates three different types of sources. The version of the Gospel that was adapted by the missionaries from the See of Hamburg, like Ansgar the Apostle of the North, as expressed in the Saxon Gospel Heliand. The many rune stones raised in Eastern Sweden during the 11th century expressing the Christian ideas as carved stone memorials. And finally, the burial practises</p>

that change drastically during the conversion period, transforming the old burial practises into a Christian one.

All of these sources point to a sometimes deliberate merging of Pre-Christian and Christian ideas and practises, both in how it was conveyed by the missionaries and put into practice by the receiving people. This resulted in a process where a mix of ideas and practises was adapted and negotiated locally, creating a period of 100-200 years which, from our perspective, neither can be labelled Christian nor Pre-Christian.

45	<p><b>CURRENT RESEARCH ON BRONZE AND IRON AGES HOARDS</b></p> <p><b>Theme:</b> 5. Theories and methods in archaeology: interactions between disciplines</p> <p><b>Organisers:</b> Maciejewski, Marcin (Maria Curie-Skłodowska University, Institute of Archaeology) - Tarbay, János Gábor (Hungarian National Museum, Department of Archaeology) - Nowak, Kamil (University of Wrocław, Institute of Archaeology)</p> <p><b>Format:</b> Regular session</p> <p>Of all historical periods, the Bronze and Iron Ages were the time during which thousands of hoards were found, and the most complex depositional phenomena can be observed in the archaeological record. The new results from the past decades indicates to us that we have come to a new turning point in respect to the means of investigating and interpreting this very phenomenon. They are based both on new theoretical proposals, as well as on an increasingly broad range of data, describing the context of the deposition act. Other approaches focus on the elements of hoards which are being studied in some cases literally at 'microscopic' levels.</p> <p>Particularly important are the new methods used in hoards research, which include such diverse procedures as: research on their specificity in the landscape, network analysis of hoarding patterns, metallurgical studies, microscopic analysis of use-wear traces and destruction of metal objects, archaeometric analyses of arti- and ecofact accompanying metals and many others. Their use allows us to broaden the discussions that have been going on for over a hundred years about the reasons for depositing valuables, their importance in prehistoric cultures, and through better understanding of prehistoric communities.</p> <p>Both the development of archaeology and the significant growth of the number of newly discovered hoards leads one to considerations over the appropriate means for conducting research on these enigmatic finds.</p> <p>If your research interests are:</p> <ul style="list-style-type: none"> <li>hoards from the Bronze and Iron Ages;</li> <li>additionally, by analyzing them, you use a multidisciplinary approach;</li> <li>especially if you propose the use of methods that were previously not used in research of hoards;</li> <li>and/or would like to propose a new theoretical approach to interpretation this phenomenon.</li> </ul> <p>We would like to invite you to participate in our session and we hope that it will be very inspiring.</p>
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	<p><b>ABSTRACTS</b></p>
1	<p><b>PHENOMENON OF REPETITION. DEPOSITS FROM KARMIN IN SW POLAND</b></p> <p><b>Abstract author(s):</b> Baron, Justyna (University of Wrocław) - Maciejewski, Marcin (Maria Curie Skłodowska University Lublin) - Jarysz, Radosław (Archaeological Museum Wrocław) - Kuźbik, Radosław (Iskander, Wrocław) - Łaciak, Dagmara (University of Wrocław) - Lucejko, Jeannette (University of Pisa) - Mackiewicz, Maksym (Archeolodzy.org Foundation; Polish Centre of Mediterranean Archaeology, University of Warsaw) - Miazga, Beata - Nowak, Kamil (University of Wrocław) - Sych, Dawid (Independent researcher)</p> <p><b>Abstract format:</b> Oral</p> <p>Three hoards from Karmin are well-known to Polish and Central European archaeologists but have never been thoroughly studied and published. Together with fourth deposit discovered in 2017, they were a subject of multi-aspect analyses and the monographic work has been published recently.</p> <p>The deposits are special due to several reasons. It is primarily the precisely known location of the finds that makes them so unique. They were arranged along a straight line running along the SW-NE axis and deposited in similar landscape conditions. The standard deposition model included placing at least part of the items in a ceramic vessel. All of the finds are of similar chronology, that is HaB2-3 – Montelius V – 950-800/750 BC.</p> <p>We want to present the results of our two-year project – starting from the history of discoveries, typology, chemical composition, macro and microscopic observations of manufacture and use. We also applied comparative morphometric analysis based on 3D scanning results, residue analysis of ceramic containers and landscape studies. The variety of analytical tools gave us an unique chance to obtain rich data on both metallurgical skills and the place of the deposits in the social and cultural landscape of a small settlement region in SW Poland at the very end of the Bronze Age.</p>

2

THE URNFIELD PERIOD METAL HOARDS IN SOUTH BOHEMIA: FIND CIRCUMSTANCES, TOPOGRAPHY AND ANALYSES

**Abstract author(s):** Chvojka, Ondrej - John, Jan - Šálková, Tereza (Univerity of South Bohemia) - Kmošek, Jiří (University of Pardubice)

**Abstract format:** Oral

Today, they are known more than 50 metal hoards in the region of South Bohemia (Czech Republic). Most of them (about 30) were discovered in the last 15 years and often they have well documented find circumstances. These newly rescued hoards bring us many new information about the artefacts used at that time, about metallurgy, trade, routes and foreign contacts, rituals as well as about connections between hoards, settlements and other types of sites. In our presentation we will focus especially on following topics:

- Topography of hoards: besides hoards from “open landscape” we have some hoards from settlements, hillforts and in one case from a tumulus. Do have hoards from the different types of sites different character? Can the different topography of hoards (slopes, river banks, hill-tops etc.) provide a clue for their interpretations?
- Chemical analyses of artefacts from hoards. In the last years there were analysed many final products, their fragments as well as ingots and slag by XRF, NAA, isotope-analyses etc. Can these analyses contribute to the question of origin of metals (copper, tin) and to our knowledge about the metallurgy of the Bronze Age?
- Archaeobotany of hoards. Can the pollen-analyses, analyses of plant macroremains or of charcoals contribute to the ways and reasons of hoarding? Can they help us to reconstruct the landscape in the surroundings of a hoard?

The paper will present the methods and results of interdisciplinary approaches to the study of some South-Bohemian metal hoards of the Late and Final Bronze Age (Br D – Ha B). Some of them can give us answers to the mentioned questions or to the interpretation of some hoards.

3

THE STUDY OF THE TÄRTĂRIA I & TÄRTĂRIA II HOARDS. AIMS AND CHALLENGES

**Abstract author(s):** Bors, Corina Ioana (National History Museum of Romania - MNIR)

**Abstract format:** Oral

In 2012, by a large scale archaeological excavation occasioned by the construction of a future motorway, were discovered two hoards of bronze and iron objects. These were discovered on the southern limit of a very large prehistoric site, located on the left bank of the middle Mureş valley, at Tărtăria (Alba county, Romania). The two hoards were discovered within an outlining ditch (a particular fortification feature), marking the southern limit of the site. The structure of the deposits is complex and varied, containing weapons, tools, jewellery and harness objects. The first hoard comprises more than 300 objects, being one of the largest ever found corresponding to the 9th–8th c. BC period in the Carpathian Basin, while the second consists of 50 objects. There are a series of multi-disciplinary investigations made for the further study of these finds. In the framework of the PILOT project, were made a series of optoelectronic investigations upon more than 120 objects (of bronze and iron): spectroscopic recordings (LIBS and XRF) on certain objects, but also a series of X-rays of the “nuclei” of objects from the Tărtăria I hoard, as well as certain objects were 3D scanned in order to obtain digital models used of high resolution. Last but not least, given the structure of the deposition, was possible to obtain a series of 14C data, on bone samples from the upper part of the deposition. Thus, a complex set of data was obtained in order to be used for an integrated and multidisciplinary study of the two hoards from Tărtăria, an important discovery which determines significant reconsideration about the so-called “Bălvănești - Vinț” horizon (= DFS V – VI). All these results will be presented in the paper, as a starting point for a further discussion on how such finds can be best investigated.

4

STILL A PART OF THE NORDIC CIRCLE? PUTTING A PIECE IN THE PUZZLE

**Abstract author(s):** Nessel, Bianka (Institute of Pre- and Protohistory, Mainz University) - Schopper, Franz (Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Landesmuseum)

**Abstract format:** Oral

The southern fringes of the Bronze Age Nordic Circle are less well investigated in regard to hoarding patterns. A newly discovered and for the region quite unusual find from Sonnenberg in the Oderhavel district contains mainly ingots and remains of metallurgical production in contrast to traditional elements for Period V hoards such as weapons and jewelry. Similar finds are very uncommon in northeastern Germany. Investigation of the ingots indicate that the region was entangled in diverse intra and supra regional networks, which might have been much more intense than previously thought. The study aims to investigate two main points: at first we deal with the question if hoards can be used as an indicator for raw material networks in the late Bronze Age. Secondly we want to provide new insights into the raw metal supply at the end of the Bronze Age in a region which is situated between two major hoarding centers: the Nordic Circle and Central Europe.

5

THE USEFULNESS OF METAL HOARDS FOR CONSTRUCTING PERIODISATION SCHEMES – SOME EXPERIENCES FROM THE POLISH PLAIN

**Abstract author(s):** Dziegielewski, Karol (Jagiellonian University in Kraków, Institute of Archaeology)

**Abstract format:** Oral

The hoards of metal objects are a group of sources of particular importance for the archaeology of metal ages, especially the Bronze

6

NEW PERSPECTIVES ON EARLY IRON AGE HOARDS OF ARMORICAN SOCKETED AXES: FROM OBJECTS TO CONTEXTS

**Abstract author(s):** Cabanillas de la Torre, Gadea (Service régional de l’archéologie de Bretagne, Ministry of Culture)

**Abstract format:** Oral

As most deposition phenomena of the Late Bronze and Early Iron Ages, hoards of Armorican socketed axes have been traditionally investigated as isolated assemblages of objects. Artefact-focussed approaches have led to a very precise typology of those rather standardised objects and to a good knowledge of their metal composition, but have failed to provide an accurate chronology or a solid interpretation of the axes’ biographies and functions. However, recent fieldwork has provided valuable data on the contexts of these finds. Excavations in Brittany and Normandy (Northwest France) open brand new perspectives for the investigation of the place of metallic hoards in landscapes and settlement or funerary sites. A synthesis of these new data is presented here, based on the ongoing excavations at Saint-Glen (Côtes-d’Armor, Brittany). The discovery of a hoard of Armorican socketed axes within an Early Iron Age building raises several key issues for the understanding of metal deposition practices during this period: the link with occupation patterns at both a regional and interregional scale must be examined, as similar approaches are being developed all over Europe, beyond the Atlantic area. It also proves that, despite previous chronological confusions, a long-term approach including the Late Bronze Age is necessary for a full understanding of the evolution of hoarding patterns and their link with other dynamics.

7

WETLAND DEPOSITION IN THE IRON AGE: INTER- AND INTRA- REGIONAL STUDY OF WALES AND SCOTLAND

**Abstract author(s):** Treadway, Tiffany (Cardiff University, SHARE)

**Abstract format:** Oral

There are numerous studies for terrestrial hoards and traditions throughout Britain. While wetland hoards are understood as a common occurrence, holistically little research has been performed in comparison to their terrestrial counterparts in Britain, especially Wales. Likewise, hoarding traditions are well understood for both the Bronze Age and Roman periods, but still obscure for the Iron Age. Therefore, this project has performed holistic analyses for wetland deposition traditions utilising two study zones: Wales and Scotland. This approach has revealed favoured material types, manufacture periods, preferred wetland locations and soil type, and patterns within deposition practices for both inter- and intra- regional comparisons. For example, the favoured material used for object manufacture of chosen pieces is copper alloy – which does not comply with the shift in economic preference that characterises the Iron Age. Therefore, the use of copper alloy is a continuation of wetland deposition tradition from the Bronze Age and continues after the Roman occupation. The study has revealed three broad categorical types of hoards found in a wetland context: single, paired, and hoard. Within these categories, variation in single and multi-period deposits are also addressed. While it is popular to contest the intention of deposition, the result of such performances was clearly to strengthen social bonds for the nuclear, extended, or communal groups associated.

8

FRAGMENTATION OF METAL IN BRONZE AGE EUROPEAN HOARDS

**Abstract author(s):** Lago, Giancarlo (Sapienza Università di Roma)

**Abstract format:** Oral

From the Middle Bronze Age, a change appears in central European hoards. Complex groups of broken items compose random clusters. A considerable and growing number of fragmented metal objects are buried together. Metal fragmentation is a well-known phenomenon and diverse theories have been so far stated at explaining it as utilitarian or ritual custom. However, systematic studies dealing with the fragments are still lacking. Detailed research on the phenomenon is proposed here. The research has been led on over 10000 bronze objects and over 300 hoards from a large sampling area involving a wide area among Italy, Slovenia, Austria, Switzerland and Germany. It has been yielded a quantification of the phenomenon and the main theories about the fragmentation custom (ritual, recycling-aimed and pre-monetary) have been tested on the collected sample. Much hints from the sample data suggest that the ritual fragmentation and breaking to recycle should be debunked. Most of the fragments probably were traded many times before to be deposited.

9

RECYCLING RITUALS? THE LATE BRONZE AGE HOARD FROM HEGRA, NORWAY

**Abstract author(s):** Henriksen, Merete (NTNU University Museum)

**Abstract format:** Oral

The Bronze Age hoard from Hegra in Stjørdal, Trøndelag, comprising more than 40 complete objects and fragments of bronze was discovered in 2017, making it one of the largest depositions of metal objects from the Bronze Age in Norway. Among the objects were 26 socketed axes of which 6 had been beaten or flattened. Small fragments of bronze had been put inside their sockets. Two casting jets were also amongst the objects found. Following the discovery, an excavation was carried out in part of the field where the objects had turned up. The site thus represents a rare example of a well-documented deposition site in Norway from the Bronze Age.

The objects, which date to c. 900-500 BC, would traditionally have been categorized as a merchant`s hoard, meant to be retrieved and recycled. However, the excavation of the site revealed that the objects had been deposited in or close to a former wetland. In the vicinity, there are also numerous rock art sites, indicating that this was an important ritual landscape in the Bronze Age. But does this context mean that the hoard from Hegra should be interpreted as a votive offering? Or could it be that the categories we apply in order to explain object deposition, do not provide the best explanations for the variety that can be observed within the large group of depositions? This paper takes a critical look at the theories put forward in order to make sense of object deposition in an attempt to come closer to an understanding of the hoard from Hegra.

10

THE DEPOSITION OF INGOLSTADT-DÜNZLAU (BAVARIA) AND THE FRAGMENTATION OF BRONZE OBJECTS IN LATE BRONZE AGE SCRAP-METAL HOARDS

**Abstract author(s):** Skolaut, Jan-Martin (Albert-Ludwigs-Universität Freiburg)

**Abstract format:** Oral

The paper deals with the Late Bronze Age hoard of Ingolstadt-Dünzlau in Bavaria which was excavated in 2014. It consists of over 1800 objects weighing more than 33kg, thus making it by far the largest known deposition from the Urnfield period in southern Germany. The hoard contains a wide range of objects like weapons, tools, ornaments, ingots and casting-waste. About 95% of the objects are fragmented, which offers an extraordinary opportunity to examine the patterns of fragmentation and destruction in Late Bronze Age hoards. I am dealing with these patterns in my current PhD research supervised by Prof. Dr. Christoph Huth at Albert-Ludwigs-University Freiburg. This far I have recorded and documented all the objects of the hoard. Special attention has been paid to features like weight, size, but also patterns of manufacture, use-wear and breakage. Apart from presenting this outstanding archaeological find for the first time to the public I will concentrate on the macroscopic patterns of fragmentation. Furthermore, the paper deals with an interdisciplinary research project on fragmentation patterns in Late Bronze Age scrap hoards. This project is based on a co-operation between the Albert-Ludwigs-University Freiburg and the Römisch-Germanisches Zentralmuseum Mainz (RGZM). It aims to establish standardized descriptions of fragmentation patterns on a macroscopic and microscopic scale as well as metallurgical and metallographic analyses and experiments on modern replica of bronze artefacts.

11

COMPARATIVE TECHNOLOGICAL OBSERVATIONS OF MIDDLE BRONZE AGE AND KOSZIDER PERIOD HOARDS AND BRONZE OBJECTS FROM GRAVES

**Abstract author(s):** Gyöngyösi, Szilvia - Juhász, Laura (University of Debrecen) - Barkóczy, Péter (University of Miskolc) - Cseh, Julianna (Tatabányai Múzeum) - Szabó, Géza (Wosinsky Mór Museum Szekszárd)

**Abstract format:** Oral

The rich and diverse bronze findings from the graves and hoards of the Transdanubian Encrusted Pottery Culture excavated in the environs of Tatabánya, in a smaller geographical region, and of the Early Tumulus Culture provided, on the one hand, a good opportunity to compare the metalwork products of two consecutive periods and also to observe the similarities and differences between the hoards and the funerary attachments.

In the SEM-EDS elemental composition analysis we focused on two directions: the results of the analyses of the average plot composition allowed for the grouping of samples, and the phase analyses helped identify those existing phases that served for us as additional information to the metallographic tests. In the course of the metallographic test and the micro structure analysis we obtained information mainly about the manufacturing technique used, which included the question whether the specific object was produced by casting, shaping subsequent to casting, and occasionally by heat treatment, but in addition to the above, by using the structure analysis and examining the corrosion processes we could trace the biography of these objects, even after removed from use. The data and the observations reflected the use of varying base material and extremely diverse technologies. Evaluating these with the observations made at the excavations and the historic background, the difference between the two consecutive periods became clearly apparent, both in terms of the base material used and the procedures applied in the course of bronze processing. Also, the comparison of the hoards and the bronze objects from burials shed light to the differences that are apparent not only between the various types according to their use (tools-ornaments), but also in terms of the depositing of the jewels and such differences are quite likely to relate to the rite of burials.

12

BRONZE AGE HOARDS IN SOUTHERN CARPATHIAN BASIN AND BALKANS - AN ARCHEOMETALLURGICAL PERSPECTIVE

**Abstract author(s):** Gavranovic, Mario (Institute for Oriental and European Archaeology-OREA, Austrian Academy of Sciences) - Mehofer, Mathias (VIAS, University of Vienna)

**Abstract format:** Oral

The paper will present new results of archeometallurgical analyses of over 700 samples from Bronze Age contexts found in southern part of Carpathian Basin and adjacent area of Balkans. In particular, we will focus on the analytical results of objects from hoards of Late Bronze Age (14th–9th centuries BC), including ingots, semi-finished and finished artefacts. The typological diversity of objects from regions under study in Serbia, Croatia and Bosnia-Herzegovina enables the assessment of different regional and supra-regional networks that had decisive impact on the composition of the hoard inventory. Moreover, the hoard context provides also an opportunity to examine specific ensembles with different analytic methods (XRF and Lead isotope analyses) in order to reveal the various exchange and supply systems of copper as raw material. The first evaluation indicates the existence of several regional metallurgical networks as well as distant contacts with e.g. the Mediterranean. Apart from typological and chronological aspects, the analysis of single hoards involved also possible analytic correlations between ingots (raw material) and finished artefacts within the same context of deposition. Furthermore, the results of archeometallurgical investigation are also compared with distribution patterns based on archaeological research.

13

“TWIN HOARDS” FROM THE BUDA HILLS AND THEIR SELECTION

**Abstract author(s):** Tarbay, János Gábor (Hungarian National Museum)

**Abstract format:** Oral

The paper introduces a new metal hoard from Budakeszi-Özvölgy-tető (Hungary, Transdanubia, Pest County) which was excavated by the Hungarian National Museum. The assemblage is originating from a hilltop occupied between the end of the Middle Bronze Age to the Late Bronze Age (Ha A2/Ha B1). The context of the hoard supports the possibility that the selection and placing of the objects were highly structured. It was deposited in two distinctive heaps about 10 cm from each other. The larger heap (A) consisted of 96 bronze objects, mostly different types of ingots, miscasts, as-casts on top of which group of rings were placed. An intentionally broken metal cup was laid right next to Heap A. The second heap (B) had a completely different character regarding type and technological features of the selected finds. It is a personal set, consisting of a Passementerie fibula pair, two professionally manufactured socketed axes and three decorated spearheads.

In addition to the introduction of this assemblage to the first time, the presentation focus on the parallels and interpretation of above context. Special emphasis will also be given to the characterization of individual hoard selection by wear analysis. Since all finds from the Budakeszi hoard preserved in an exceptionally good condition, the applied method was able to reveal even the finest traces related to manufacture, use and manipulations. Thus, individual elements of the hoard were classified according to their life-cycles, which allowed the description of the hoard`s concept of selection. The paper will also explore the regional Ha A2/Ha B1 hoarding patterns by comparing the selection of objects in the Budakeszi hoard to the contemporary hoard assemblages from the Transdanubian Urnfield territory.

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LATE BRONZE AGE METAL HOARD FROM NOWE KRAMSKO

**Abstract author(s):** Nowak, Kamil (Institute of Archaeology University of Wrocław) - Orlicka-Jasnoch, Julia (Archaeological Museum of the Middle Oder in Zielona Góra, Świdnica)

**Abstract format:** Oral

The presentation concerns the hoard of metal objects, which was discovered in 2015 in Nowe Kramsko, western part of Poland. It is the largest deposit discovered in recent years in Poland, containing about 400 metal objects and weighing 14 kg. It was deposited in a ceramic vessel, the lower part of which was also discovered. The hoards inventory mainly consists of items deposited in fragments (both tools and ornaments), as well as lumps of raw material and objects not well manufactured. In addition, the hoard contained objects combined with casting production – a bi-valve metal casting mould and two metal tools, most likely related to the production and use of casting moulds made from nondurable materials.

During the presentation several issues will be discussed. The results of the analysis of production and use-wear traces on objects will be presented, which allows to determine whether items have been deposited new or used. Discussing the issue of fragmentation of objects will allow to determine if any pattern of such actions is visible. The results of experimental works related to the object used for the production of casting moulds will also be presented.

The research was financed by National Science Centre (Poland), UMO-2017/27/N/HS3/01097 and Ministry of Culture and National Heritage (Poland).



a. **THE ARCHAEOLOGICAL EXAMINATION OF THE NEW SITULA OF HAJDÚBÖSZÖRMÉNY**  
**Abstract author(s):** Gyöngyösi, Szilvia - Juhász, Laura (University of Debrecen) - Barkóczy, Péter (University of Miskolc) - Szabó, Géza (Wosinsky Mór Museum Szekszárd)

**Abstract format:** Poster

The introduced situla is a part of the world-famous hoard of Hajdúböszörmény. The presentation proves that this object belongs to the hoard because this item was found later. Additionally, a detailed material testing and description performed to excess the data about the situla. Data referring to separate workshops manufacturing series of bronze vessels in the Carpathian basin are available in the Upper Tisza region, from the Ha A2-B1 – period, from the appearance of Hajdúböszörmény type of situlas. At the site which gave its name to the finds, there is a significant difference between the situla found earlier and found later, in terms of their size, and the number and positioning of their handles. Their decoration was not prepared by using the same set of tools and, despite the apparent similarities, their composition differs in the miniscule details. All these reflect that although the craftsmen of the two situlas were not identical, they belonged in the radiance of the same workshop. However, the similarities of the older situlas found in 1858 with the vessels that appeared in the sites of Nyírlugos, Abos (Obišovce, SK,), Granzin (D) are so extensive that it raises the possibility of not only an identical workshop but also an identical craftsman. In addition to the observations of form and technology we could also conduct a detailed metallographic analysis of the newly found situla of Hajdúböszörmény. Its result confirmed our preliminary assumptions related to the manufacturing of the object and the technology used for that. The results of the complex archaeometallurgical tests of the new situla of Böszörmény constitute a good starting point for the planned comparative analysis of similar types of ceremonial vessels found in the wide area of Europe.

46 **INTERACTION IN ACTION: HUMAN AND SOCIETAL ADAPTABILITY IN RESPONSE TO CHANGES IN CLIMATE AND ENVIRONMENT IN MEDIEVAL EUROPE**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Loftsgarden, Kjetil (Museum of Cultural History, University of Oslo) - Svensson, Eva (Karlstad University) - Ferenczi, László (Central European University, Budapest; New Europe College, Bucharest) - Iversen, Frode (Museum of Cultural History, University of Oslo)

**Format:** Regular session

The aim of this session is to bring together researchers working on landscape and settlement development in relation to climate and environmental changes. We are especially interested in papers dealing with how humans and society adapted to and mitigated changes in climate and environment in Europe from Late Antiquity to Early Modern period.

New evidence from tree ring records, vegetation historical analyses, ice cores and climate models have indicated several abrupt changes in climate, as well as other environmental consequences related to climate change and human impact on European history. However, we have yet to identify and understand the long-term responses to these shifts. In this session, we wish to emphasize mitigation and adaptation strategies of communities, and the interplay between social and environmental factors regarding different regions of Europe.

Large-scale archaeological excavations and surveys have generated a vast amount of scientific materials (e.g. radiocarbon dates, pollen data and macrofossils) for further research. In addition, large archaeological databases have been digitised, making available descriptions and spatial information for millions of archaeological finds and sites. We are at a point where this data is readily available and can be synthesised to gain an overarching view of socio-economic developments. Similarly, the research on the anthropogenic landscape and human – nature interaction represents one of the most interdisciplinary fields of archaeology considering its subjects and methods. We therefore especially welcome papers handling big data and presentations on interdisciplinary studies.

**ABSTRACTS**

1 **THE DEMOGRAPHY OF IRON AGE SCANDINAVIA**  
**Abstract author(s):** Loftsgarden, Kjetil (Museum of Cultural History University of Oslo)

**Abstract format:** Oral

Prehistoric demographic patterns have long remained hidden, but the availability of large data sets and new tools and methods has given us the opportunity to look behind the veil of the past and uncover the demography of the Iron Age.

Although it is often stated that abrupt changes in climate had severe societal impacts, these are seldom explicitly defined or quantified. In this paper, I will make use of a systematic approach to large archaeological datasets to identify and understand the long-term societal responses to sudden shifts in climate. Specifically, I will explore the ebb and flow of the past populations in Scandinavia in the period 1–1000 AD, and how these relate to climate and environmental changes.

In Scandinavia, non-Christian burials were used up until the 11th century. This comparatively homogenous grave material gives a unique, and largely unused, approach to uncover relative changes in population size and density – as well as the spatial development of settlements and inhabitation over time. In addition, I will analyse large datasets of radiocarbon dates from archaeological sites. The method is predicated on that the modelled radiocarbon data will reflect variations in human activity.

2 **THE EVENTS OF AD 536/540 AND THEIR IMPACT ON RURAL SETTLEMENTS IN SCANDINAVIA**  
**Abstract author(s):** Iversen, Frode (Museum of Cultural History University of Oslo)

**Abstract format:** Oral

AD 536 is a poignant date in European history, and marks the advent of a series of documented environmental changes that affected societies throughout Europe in various ways. Sudden and severe climate deterioration led to vast crop failure and was followed by plague in the following decades. By investigating archaeological and climatic data from the centuries AD 500-800 across Scandinavia, this paper seeks to address a range of topics related to human response to changes and disasters from a medieval perspective. A great number of large-scale archaeological excavations in Southern Scandinavia during the last decades have generated a huge scientific material (settlements, production sites, etc. with associated archaeobotanical material) for further research. In particular, Iversen will discuss the elite response on the events and the following transition of Scandinavian manors and their subordinated settlements.

The research presented is part of the ongoing project Volcanic Eruptions and their Impacts on Climate, Environment, and Viking Society in 500–1250 CE (VIKINGS) (2018-2023) funded by the Norwegian Research Council and the University of Oslo (NFR TOPPFORSK, grant 275191).

3 **DID THE 536 DUST VEIL EVENT START IN AD 410? SOCIETY, RESILIENCE AND BAD YEAR ECONOMICS**  
**Abstract author(s):** Gjerpe, Lars Erik (University of Oslo)

**Abstract format:** Oral

Several authors have demonstrated that mass deaths, abandonment of settlements and political, religious and social upheaval followed the bad years 536-540 AD. Why had the 536 Dust veil event and the later “Antique Little Ice Age” such an impact in Scandinavia? Different societies react in different ways to the same stimulus. Still, periods with temperature and precipitation less than ideal for cereal production and husbandry and even long periods with low summer temperatures occurred throughout history and prehistory without such devastating effects. Thus, critique of mono-causal explanation focusing on the sudden change in climate has gained support. The complex interplay between humans, nature and society’s resilience are by several researchers regarded as vital to comprehend the societal change in the 6th and 7th century. There is evidence change in the archaeological inventory, i.e. settlements, burials, pottery production and artefact assemblies such as weapon combinations, started before 536. I will explore if the fall of the Roman Empire and the subsequent lack of prestige goods in Scandinavia undermined the elite, made the society less resilient and allowed the crop failure to have such a big influence.

4 **CLAIMING AND NAMING LAND. PERSONAL NAMES IN PLACE NAMES AND RESTRUCTURING OF LAND RIGHTS IN LATE IRON AGE SCANDINAVIA**  
**Abstract author(s):** Albris, Sofie Laurine (University of Bergen)

**Abstract format:** Oral

This paper will discuss how social change and restructuring of settlement patterns may be reflected in the use of personal names in place names in Iron Age Scandinavia. Naming land after certain individuals can be a way of marking ownership and claims to land. The first place-names using personal names are thought to appear in the 4th century AD and this trend continues with a growing number of names into the Viking Age. However, mostly our dating of these place-names is only very broad. Further, we need a better understanding of the social background of the individuals behind the personal names used in place-names. Both environmental, archaeological and linguistic data indicate that dramatic changes happened in society during the 6th century. One example is the foundation of several new magnates’ farms or so-called central places around 550 AD. The paper will discuss these name types in relation to the present archaeological knowledge about settlement structures and dynamics. Should we reconsider some of the place names that are coined with personal names as evidence of a horizon related to restructuring of land in the wake of the 6th century changes?

5 **LATE HOLOCENE HUMAN-RESILIENCE IN THE CENTRAL PO PLAIN (NORTHERN ITALY)**  
**Abstract author(s):** Brandolini, Filippo (Università di Milano)

**Abstract format:** Oral

The transition from Roman to the Early Middle Ages represented a crucial phase for the reorganisation of human settlement strategies in the Central Po Plain (Northern Italy). The collapse of Roman hydrological systems in association with a cooling climate phase (i.e., the so-called Migration Period or the Dark Age Cold Period) triggered a progressive waterlogging process of large flood-prone areas (aka backswamps). Woods, swamps and uncultivated areas became the typical features of the Early Medieval landscape. The waterlogging process of the area continued until the 10th century CE influencing human sustenance and settling practices. This research investigates human adaptation to fluvial environments between Late Antiquity and the Middle Ages through a multi-disciplinary approach that combines archaeological records, geomorphological analysis and geo-spatial statistics. This study aims to assess how different water management strategies in the Roman and Medieval periods influenced the spatial distribution of sites, and to evaluate the relative importance of agricultural suitability over flood risks in the two historical phases. For instance, Early Medieval flood management practices had the effect of reclaiming the swamps, but also altered the natural geomorphological development of the area. This research contributed to understanding how the socio-political factors of past societies played a key

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role in human resilience to geomorphological hazards related to alluvial context and exceptional floods triggered by climate changes.

**SEARCHING FOR DRY LAND? SETTLEMENT EXPANSION INTO MARGINAL UPLAND AREAS IN THE EARLY PHASES OF THE LITTLE ICE AGE**

**Abstract author(s):** Svensson, Eva (Karlstad University) - Pettersson, Susanne (Norskt maritimt museum)

**Abstract format:** Oral

It is generally considered that marginal upland areas were colonized with agrarian settlement fairly late, when good land for agriculture was already claimed. It is also presumed that in times of settlement desertion, such as during the late medieval agrarian crisis (in the 14th century), marginal upland areas were first abandoned as surviving people moved to vacant land and farmsteads in areas with better conditions for cereal cultivation. The onset of colder climate, the little ice age, during the late medieval agrarian crisis, has been another argument for the presumption that marginal upland areas were deserted at the time.

There are also sites with deserted settlements in marginal upland areas. But there also seems to be another trend. Interdisciplinary research and fieldwork, paleobotanical and archaeological investigations, have shown that in some marginal upland areas there has been an INCREASE in agrarian activities, and indeed also new settlements in the 14th and 15th centuries in. Both settlements and fossiled fields have been documented in upland settings, well above the traditional settlement areas by lakes and rivers.

An hypothesis put forward in this paper is that precipitation and floodings were major problems during the early stages of the little ice age, and that expansion of settlements and agrarian landuse into upland moraine areas was a way of avoiding the consequences of heavy rainfalls and flooding. Also, moving out of villages and hamlets provided opportunities for innovative risk management and introduction of agrarian technologies otherwise impossible to stage in hamlets and villages with regulated land use practices.

7

**THE COLONISATION OF UPLANDS IN MEDIEVAL IRELAND AND BRITAIN: LOCAL FACILITATION AND WIDER CAUSATION**

**Abstract author(s):** Costello, Eugene (Stockholm University)

**Abstract format:** Oral

The study of how medieval farmers colonised upland environments, where soil type and temperature sometimes limit cereal production, has the potential to transform our understanding of resilience in rural communities. Yet despite the emergence of a significant amount of archaeological and palaeoecological evidence for year-round settlement in hilly areas of Britain and Ireland, comparative research on the subject is still rare in this part of Europe. As a result, there is a lack of clarity on how uniform colonisation was over time and space, and how it might be explained without resorting immediately to external determinism by climate, population pressure or market demand. By reviewing the timing and extent of colonisation in various contexts from Ireland, south-west England and the north of Britain, I argue that ‘glocal’ perspectives may provide more realistic explanations of the phenomenon. I highlight how various factors - the anthropization of soil through transhumance, the presence of favourable geology, continuities from prehistory and the availability of non-agrarian resources - could play crucial facilitative roles at a local level. Indeed, when combined with regional socio-economic trends, they could even override unfavourable climatic conditions. As archaeologists look increasingly to large-scale modelling of land-use change, this will hopefully serve as a reminder not to lose sight of the local environmental context and knowledge of the peoples they are studying.

8

**WAYS OF ADAPTATION: CAUSES AND EFFECTS IN HUMAN LANDSCAPE INTERACTION IN MEDIEVAL HUNGARY**

**Abstract author(s):** Ferenczi, Laszlo (Charles University, Prague) - Zatykó, Csilla (Institute of Archaeology, Research Centre for the Humanities)

**Abstract format:** Oral

In the past decades, archaeological research of settlements has focused on regional scale studies, often accompanied by historical and paleo-environmental investigations as well. They have already yielded sufficient amount of data to draw a more complex picture of the basic environmental, landscape and settlement changes in medieval Hungary. According to the common view, changes in climate, hydrology and vegetation influenced human settlement strategies, settlement patterns and agrarian techniques to various extents. It is also widely accepted that several methods of landscape exploitation applied by village communities caused significant alterations in the landscape and environment around them.

Looking at the environmental dynamics and the changes in settlement behaviors side by side, it often seems plausible to consider them as causes and effects of an ever-going interaction, regardless of the sometimes indistinct extent of their correlation. This paper, focusing on two different geographical regions of Hungary, attempts to shed light on the possible effects and causes of changes in the medieval landscape and settlement dynamics. One of the recent case studies looked at settlement abandonment and its connection to hydrological changes at the Transtisza region in Eastern Hungary, while another case study focused on settlement strategies in the Transdanubian region in Western Hungary, yielding different answers to environmental changes. In our presentation we will address some methodological and interpretive problems, to highlight the relevance of a more extensive use of settlement historical data (possible land use changes in the Late Middle Ages, the reconstructed road network, settlement hierarchy etc.).

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**LOST IN TRANSMISSION - FOLLOWING KNOWLEDGE IN HUNTER-GATHERER SOCIETIES [PAM]**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Wild, Markus (ZBSA - Centre for Baltic and Scandinavian Archaeology; UMR 7041 ArScAn - Ethnologie préhistorique - Söderlind, Sandra (Institut für Ur- und Frühgeschichte der Universität Kiel) - Caron-Laviolette, Elisa (Université Paris 1 Panthéon-Sorbonne; UMR 7041 ArScAn - Ethnologie préhistorique)

**Format:** Regular session

In current archaeology, artefacts are no longer viewed as fragments of archaeological “cultures” in the same sense as during the culture historical period, but instead we attempt to reason about the people who produced and implemented these objects. The technologies and techniques that make up the basis for prehistoric tool production, like any other technical traditions, result from the accumulation of knowledge and know-how. In order to be adopted widely enough to leave an archaeological signature, such knowledge had to spread, through mobility and migrations, diffusion of ideas or a combination of the two. Yet oftentimes, the discussion ends on such a matter-of-fact point without any further enquiry into the mechanisms behind knowledge transmission.

In this session we would like to address the transmission of knowledge in hunter-gatherer societies through the study of their material culture. Participants are invited to present papers relating to both horizontal and vertical transmission, as well as to explore possible combinations between these two directions. We wish to discuss a variety of perspectives, such as apprenticeship processes and communities of practice. Related questions also include the spread of traditions through mechanisms of innovation, diffusion and adoption, technological change over multiple geographical scales and the role of social networks in the diffusion of technical know-how.

The ultimate goal of this session is thus to share, compare and explore strategies for studying knowledge transmission in regards to relevant archaeological materials, such as lithic, osseous, or ceramic industries, using the methodological framework of technology. We would therefore welcome the participation of researchers with a wide range of foci, methodologies and approaches, such as ethno(archaeo)logy, comparative case studies, technological analyses, chaîne opératoire, (paleo)sociology, or agent-based modelling, in order to ultimately join our efforts to approach the extremely vast and complex topic of knowledge transmission in hunter-gatherer societies.

ABSTRACTS

1

**THE TECHNOLOGICAL TURN – OR HOW TO MAKE SOCIAL SENSE OF LITHICS**

**Abstract author(s):** Berg-Hansen, Inger Marie (University of Oslo, Museum of Cultural History)

**Abstract format:** Oral

During the last decades, a growing number of scholars have taken an interest in a technological approach to the archaeological record. This turn in how technology is studied opens up for new progress in our understanding of the relationship between the archaeological record and the agents and societies that produced it. So far, the focus has mainly been on agents and individual actions, while the relations to larger social and cultural processes and practises have not received the same attention. Whereas some theoretical and methodological advances have been made, the theoretical foundation of such an approach is still in need of development and discussion.

The paper will concentrate on the potential in the technological approach to explore large-scale sociocultural processes, as well as the theoretical and methodological basis on which we can build such an approach by combining Mauss’ technological perspective with cultural knowledge transmission theory and Durkheim’s concept of social density. The paper suggests a model of the relationship between social organisation, knowledge transmission and cultural variability, as well as illustrates its application with archaeological examples.

2

**THE WEIGHT OF TRADITION: EXPLORING VARIABILITY WITHIN MAGDALENIAN BLADE TECHNOLOGY**

**Abstract author(s):** Caron-Laviolette, Elisa (Université de Paris 1 - Panthéon Sorbonne; UMR 7041 - Ethnologie Préhistorique)

**Abstract format:** Oral

When investigating a technical phenomenon, we as archaeologists tend to identify norms, and then explore the degree of variability around them. Norms are usually interpreted as technical traditions, transmitted from generation to generation and shared at certain geographical and social scales. Variability around these norms is then typically seen as resulting from the execution of these shared concepts in a variety of environmental, economic, and social contexts.

Blade technology in the Late Magdalenian would initially seem, and has been presented as, a well-documented, long-lasting and relatively homogeneous tradition, taught and shared throughout space and time. However, our in-depth study of a lithic assemblage from the site of Étiolles, in the Paris basin, has highlighted multiple levels of variability in Magdalenian blade production, some of which cannot merely be explained by shifting contexts of execution (such as raw material diversity, variable skill-levels, or changing economic objectives).

The existence of such an alternative blade production system calls into question the so-called stability of blade technology during the Magdalenian, as well as the accuracy of our technological models for that period. It also underlines the need to investigate the

3 extent at which this specific tradition was transmitted and its relationships with others, be they diachronic or synchronic. Is this a widespread or a restricted phenomenon, and in the latter case, what could explain such limited diffusion?

### LEARNING THE HARD WAY - FLINT, PRESSURE AND TRADITION

**Abstract author(s):** Söderlind, Sandra (Kiel University, ROOTS)

**Abstract format:** Oral

Transmission of knowledge in Mesolithic societies is in many cases invisible to us today, as we missed those fleeting moments of social interaction. However, some types of interactions will produce physical traces that remain until today. The meeting of people, for transmission of knowledge (and know-how) relating to flint knapping, is one such example.

The production of blades using pressure technique is considered to be technologically complex (Pelegrin 2012). The reason for this is that pressure techniques include various technological steps, such as the making of related tools and devices, pre-treatment of flint, special knowledge of body positioning etc., all of which can be seen as social arenas. This technological complexity makes concepts that include pressure techniques good subjects for studies of transmission of knowledge.

In this paper, I will discuss the transmission of knowledge relating to a specific technological concept, centred on blade production, from elongated single-fronted cores, known as handle cores. This pressure-based technology was well established in hunter-gatherer societies over large parts of Northern Europe in the 7th-5th millennium BC. The results of technological studies, from different parts of northern Europe, is used as a base for discussing various types of knowledge transfer on several societal and geographical levels.

References:

- Pelegrin, J. 2012. New Experimental Observations for the Characterization of Pressure Blade Production Techniques. In: Desrosiers, P.M. (ed.) The Emergence of Pressure Blade Making: From Origin to Modern Experimentation. Pp. 465-500.

### 4 A NETWORK-BASED APPROACH TO MODEL THE SPREAD OF LATE MESOLITHIC TRAPEZE-BASED INDUSTRIES IN IBERIA

**Abstract author(s):** Romano de Paula, Valeria (Instituto Universitario de Investigación en Arqueología y Patrimonio Histórico - INAPH, Universidad de Alicante.) - Lozano, Sergi (Departament d'Història Econòmica, Institucions, Política i Economia Mundial, Universitat de Barcelona) - Gómez-Puche, Magdalena - Cucart-Mora, Carolina - Zumalabe, Rafael - Fernández-López de Pablo, Javier (Instituto Universitario de Investigación en Arqueología y Patrimonio Histórico - INAPH, Universidad de Alicante)

**Abstract format:** Oral

The spread of trapezed-based industries in Europe, also known as the "second Mesolithic", have puzzled archaeologists for decades. At a continental scale, recent radiocarbon evidence suggests a rapid diffusion of this technological innovation with a possible origin in Northern Africa (Tunisia) and Sicily to reach Northern Italy, Southern France, and the Mediterranean region of Iberia at c.8600-8400 cal BP (Marchand and Perrin 2017). However, the mechanisms underlying the rapid spread of this technological innovation are still unknown. Social network analysis is a consolidated methodological approach to model human interaction patterns and to test hypotheses about their influence over social transmission and related phenomena. Nevertheless, this approach has still to be integrated into the archaeological research, particularly into the epistemological framework of cultural evolution (Romano, Lozano and Fernández-López de Pablo, accepted for publication). In this study, we investigate how prehistoric hunter-gatherer interactions are related to the spread of trapeze-based industries across the Iberian Mediterranean region, the Cantabrian strip and the Ebro Valley. We systematically compiled high-quality data on (i.e. well-dated) lithic assemblages and site distribution. We then used formal methods of network analysis and agent-based modelling to test the dynamics of horizontal transmission and its effect on the heterogeneous spatial and temporal variation in cultural attributes. In particular, we test different models of innovation spread in small-scale societies considering reconstructed patterns of social connectivity and population size. We finally argue that a fine-scale assessment of hunter-gatherer's socio-spatial network contributes to a better understanding of the contexts in which cultural transmission occurs.

References

- Marchand, G; Perrin, Th. 2017. Why this revolution? Explaining the major technical shift in Southwestern Europe during the 7th-millennium cal BC . Quaternary International, 428: 73-85.
- Romano, V; Lozano, S; Fernandez-Lopez de Pablo, J. (Accepted) A multilevel analytical framework for studying cultural evolution in prehistoric hunter-gatherer societies. Biological Reviews.

### 5 APPRENTICESHIP AND TEACHING? RETHINKING CHILDREN'S LEARNING IN PAST HUNTER-GATHERER SOCIETIES

**Abstract author(s):** Wild, Markus (ZBSA - Centre for Baltic and Scandinavian Archaeology, Schleswig; UMR 7041 ArScAn - Ethnologie préhistorique)

**Abstract format:** Oral

The transfer of knowledge from experienced to unexperienced people is fundamental for the survival of a group and their cultural and ideological sphere. While the transmission of new ideas from outside the community is an irregular phenomenon, the passing

on of group-related skills, ideas and decision making from the prime group to the adolescents is a regular and permanent phenomenon that must have been implemented in the daily life of past hunter-gatherers. Understanding children's learning is crucial for understanding archaeological societies. In this regard, it is surprising that little is known about the processes of vertical knowledge transmission in archaeological hunter-gatherer groups. On the contrary, many publications about Palaeo- and Mesolithic learning play with ideas of school, teaching sessions or master and apprentice, concepts that are rather modern compared to the age of the people we study. In addition, these concepts actively manage the relationships of people in a way that is hardly mirrored in archaeological assemblages.

This paper addresses the described paradox and attempts to approach the archaeological evidence from another angle. Besides the introduction of a concept of learning that derives from developmental psychology and ethnography, the paper will present the re-interpretation of several postulated archaeological learning situations with a focus on the Late Upper Palaeolithic from north-western Europe.

### 6 LEARNING TO BE AURIGNACIAN: THE STRUCTURE AND PRACTICE OF LITHIC APPRENTICESHIP AMONG COMMUNITIES ESTABLISHED IN SOUTHERN FRANCE

**Abstract author(s):** Anderson, Lars (UMR 5608 TRACES)

**Abstract format:** Oral

Cultural transmission has been part of the theoretical archaeologist's toolkit since its introduction by Cavalli-Sforza and Feldman in 1981. Much ink has been spilled regarding the direction of transmission, the selection of models to copy, or the different social learning methods entailed, yet the actual act of learning and practising is more often than not treated as a black box. Moreover, it is the material manifestations of these processes that have the most potential to elucidate not only how knowledge and know-how were acquired in the archaeological past, but also the contexts under which these were acquired. These can ultimately inform us on topics often explored in theoretical models of cultural transmission, such as the forms of pedagogy employed, which ethnotheories of intelligence were valued, and how apprenticeship was organized.

Here we will present a method for the systematic study of lithic apprenticeship, derived largely from the French chaîne opératoire approach, as it is this school of lithic study that initially explored such topics materially, beginning with the fundamental work of Pigeot in 1987. As such a method is inherently bottom-up, it situates individual action within the structure of technical tradition, therefore allowing for the inductive exploration of how apprenticeship itself was structured and articulated within a functioning socio-economic system. We will present four applications of this method to sites attributed to the Aurignacian, dated to between 42 and 33 thousand years ago and attributed to the first populations of anatomically modern Homo sapiens in Western Europe.

Cavalli-Sforza, L. L., Feldman, M. W, (1981). Cultural Transmission and Evolution: A Quantitative Approach. Princeton: Princeton University Press, 406 p.

Pigeot, N. (1987). Magdaléniens d'Étiolles. Économie de Débitage et Organisation Sociale (L'Unité d'Habitation U5). Paris: Éditions du CNRS (XXVe supplément à Gallia Préhistoire), 168 p.

### 7 ISLANDS IN A SEA OF TREES? TRANSFORMATION OF INTERACTION AND EXCHANGE ON DIFFERENT SCALES IN THE EARLY MESOLITHIC

**Abstract author(s):** Groß, Daniel - Lübke, Harald - Meadows, John - Schmölcke, Ulrich (Centre For Baltic And Scandinavian Archaeology ZBSA; CRC 1266: Scales of Transformation)

**Abstract format:** Oral

The early Mesolithic in northern Germany is generally perceived as a rather uniform and internally undifferentiated timeframe. However, recent studies highlighted that we are able to trace far more diversified behaviours and patterns of interaction than hitherto known, if archaeological data are analysed with pin-point strategies. It is increasingly apparent that social networks played major roles in Early Holocene hunter-gatherer-societies. While changes in the artefact spectrum were probably rooted in internal, socio-cultural developments, changes in communication networks coincided with environmental changes. Furthermore, our studies indicate that early Mesolithic people actively interacted with and manipulated their environment over generations, and thus had a clear impact on the landscape. Such behaviours must have been the result of in-depth understanding of faunal reproduction cycles and behavioural patterns. To understand processes of innovation and transmission of knowledge, it is important to disentangle the Mesolithic people's behaviour and environmental constraints.

This contribution will discuss several archaeological finds and findings that help to understand the transmission of knowledge and interaction between Mesolithic people on the Northern European Lowlands on different scales. By highlighting alterations in social networks that are observable through the archaeological data, it will also show where borders or barriers may have existed. This will also be discussed from a perspective of how mobility and interaction affect our understanding and reconstruction of past identity.

### 8 CULTURAL VARIATION IN THE EARLY AND MIDDLE NEOLITHIC SOUTH NORWAY

**Abstract author(s):** Olsen, Dag Erik (Museum of Cultural History, University of Oslo)

**Abstract format:** Oral

The Early (4000-3300 BC) and Middle Neolithic (3300-2350 BC) in South Norway was characterized by distinct cultural variations



between the east and west coast. While eastern norwegian groups were influenced by cultural impulses from southern Scandinavia; Funnel Beaker (TRB), Corded Ware (CW) and the Battle Axe Culture (BAC), this was not the case along the western seaboard. Agriculture was not economically important in either region until the Late Neolithic (ca 2350 BC) and hunting and gathering continued to be the main economic factor. This paper aims to explore the dynamics at play with a focus on the dispersal of ideas through contact between different social groups. A hypothesis is that the western groups over time developed distinct social traditions based on living in specific regions with little direct contact with eastern groups, even though minor presence of southern Scandinavian technologies indicates the awareness of other ways of living. The only way western and eastern groups could have interacted directly is through seasonal big game hunting in the mountain areas separating the two regions, Hardangervidda and Nordfjella. The presence of material culture specific for both regions at the settlement sites provides an interesting opportunity for discussing social interaction and the spread of ideas. The fluctuation of activity at the mountain areas represented by these sites gives an insight into changing networks and interaction.

The mountain areas offer a window into the social dynamics in the first half of the Neolithic where the material culture indicates different social tradition that changed and developed asymmetrically. Knowledge is, at least in part, reproduced through individual habitus and reflected at a group level as different local and regional social traditions. Cultural change is in this perspective explored through the degree of exposure to new ideas and the capacity for integrating these into existing social structures.

9 **BIDIRECTIONAL BLADE CORE: CONTINUATION OF PRE POTTERY NEOLITHIC B PERIOD IN EASTERN INDIA?**

**Abstract author(s):** Mandal, Priyanka ( Department of Anthropology, Sitananda College, Purba Medinipur, West Bengal)

**Abstract format:** Oral

After dating the site Mehtakheri (Madhyapradesh) and Jwalapuram (Andhrapradesh), it has been suggested that microlithic technology in Indian Subcontinent is indigenous in nature or it can be introduced by the early modern humans. Indeed, artifact assemblages are completely differing from the microlithic occurrences of the Levant and Arabian Peninsula. Until quite recently, South Koel River Basin, North Western Odisha revealed fresh microlithic assemblages that bear close resemblances with the PPNB cultural period of the Eastern Mediterranean Zone of Western Asia.

Primary to semi primary sources on hunter-gatherer groups have been taken into consideration. Intensive field surveys around the river basin brought to light 33 open-air microlithic sites with the total tool assemblages amounting to 2474. Those are mainly comprised of bidirectional blade core, unipolar core, lunate, scraper, bladelet, and ad-hoc tools. The microlithic stone tool assemblages were analyzed in detail including their dimensions and technological attributes which further emphasize the affinity among the cultural remain in between these two regions.

10 **INTERPRETATIVE POTENTIAL OF PALAEOLITHIC CHERT QUARRY SITE STELIDA ON NAXOS, GREECE**

**Abstract author(s):** Mihailovic, Danica (Institute of Archaeology, Serbian Academy of Sciences) - Carter, Tristan (McMaster University) - Moutsiou, Dora (University of Cyprus) - Dragosavac, Sofija (University of Belgrade) - Zogheib, Ciara (McMaster University)

**Abstract format:** Oral

Stelida is a major chert source located on the north-west part of Naxos island in the Cyclades, Greece. Since 2013, archaeological research of Stelida has been conducted providing the biggest dated Palaeolithic sequence in the central Aegean basin spanning from at least ( $\geq 250,000$ –9,000 B.P.). Silicate material sources represent very important type of sites that are heavily understudied in the Palaeolithic archaeology. Palaeolithic quarry sites are remarkably rare, with the handful that have been documented (in Egypt, India, Israel, Jordan and Turkey), with very few excavated. Hence, quarry assemblages provide us with the rare opportunity to gain the insight into human behaviour on the site where abundance of raw material should be enabling learning opportunities and experimentation. Those factors should also lead to the spectrum of innovative products as a form of adaptation and development of economic and related tool making specialization. This presentation is highlighting interpretative potential of such sites including knowledge transfer and detailing the use of the site and available raw materials. With that thought we will also tackle the following interpretative limitations. This will be achieved using palimpsest studies combined with technological analysis of the relevant material (clusters of cores) from different phases of Palaeolithic of Stelida.

55 **CASTLESCAPES**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Pluskowski, Aleks - Banerjee, Rowena (Department of Archaeology, University of Reading) - García-Contreras Ruiz, Guillermo (Departamento de Historia Medieval y Ciencias y Técnicas Historiográficas, Universidad de Granada) - Karczewski, Maciej (Department of History and International Relations, University of Białystok) - García García, Marcos (Department of Archaeology, University of York)

**Format:** Regular session

Building on the successful “Forgotten Castle Landscapes” session at the last EAA meeting in Bern, this session focuses on multi-scalar and multi-proxy approaches to the study of landscapes associated with castles – iconic monuments of medieval and

post-medieval Europe. The landscape approach moves the focus away from the lifestyles of elite castle communities to encompass a much broader social perspective. We will focus on three themes: What is a castle landscape, how is it studied and why should it be included in heritage management considerations? The fundamental importance of situating castles within their broader landscape context has been recognised in scholarship for several decades, but our understanding of castle territories has been largely defined by written sources relating to property and land use. Is it also possible to approach this from a material culture or topographic perspective? How does the notion of a castle landscape change with shifting settlement patterns, migration or changes in the ownership and political roles of castles? What are the most effective methodologies for understanding castle landscapes? What role do castles play in the study of medieval settlement or environment? How do we think beyond the monuments themselves to their broader spatial context from a heritage perspective? How is historical knowledge deriving from castle research disseminated and transformed into discourse? The aim of this session is to continue to explore how these key regional monuments can be reconnected with their cultural landscapes, from both research and heritage perspectives. This session is organised as a collaboration between two research projects: “Landscapes of (Re)Conquest”, which is investigating medieval frontier landscapes in south-western Europe; and “All Along the Watchtowers! Balancing Heritage Protection, Development, and Scientific Research on Buried Archaeology at European Castles”, which uses geoarchaeology to inform and drive research agendas and heritage management strategies at castles across Europe.

**ABSTRACTS**

1 **UNDERSTANDING CASTLE LANDSCAPE THROUGH TYPOLOGY**

**Abstract author(s):** Kirk, Scott (University of New Mexico)

**Abstract format:** Oral

Castles stand on the European socio-political landscape as both emblematic forms of defensive monumental architecture and the fortified residences of elites. They appear in the most disparate parts of Europe, from Islamic Spain to Gaelic Scotland. Yet, most contemporary castle studies have focused on the development and placement of castles within regionally specific frameworks; often excluding non-Christian fortresses as part of the same anthropological phenomenon. Here I take an alternative approach, focusing on commonalities in the placement of castles within four diverse geographic regions of Europe: the British Isles, Iberia, Bohemia, and Sicily. Building a typology for castles based on 1) modern features of the landscape as proxies for historic ones, and 2) a series of cluster analyses that group “like” castle environments together, I suggest that there are 8 distinct “types” of castles based on their placement. Of these, the most common are those that seem to have developed as control points for land, labor, and/or resources. To systematically classify these structures within this typology, I conclude this paper by presenting a decision tree, a sort of flow chart comprised of if-then statements. I believe this landscape-focused framework can serve as a bridge between theoretical explanations for castle development, such as *incastellamento*, and the more context specific ones that have become prevalent in English language academic literature.

2 **THE GEOARCHAEOLOGY OF CASTLES, THEIR LANDSCAPES AND HERITAGE MANAGEMENT**

**Abstract author(s):** Banerjee, Rowena (University of Reading) - García-Contreras Ruiz, Guillermo (Universidad de Granada) - Karczewski, Maciej (University of Białystok) - Kalnins, Gundars (Cesis Castle) - Pluskowski, Aleks (University of Reading)

**Abstract format:** Oral

This article presents the application of a geoarchaeological approach to holistically understand, present, and manage castles with their landscapes. Geoarchaeological data from two frontier regions are presented: the eastern Baltic, in the context of the Northern Crusades, and Iberia, in the context of the ‘Reconquista’. The persistence of multi-faith societies into the 15th century has defined the Middle Ages as a period of ongoing religious transformation within these two regions, and the funerary sphere and material identities have been examined comparatively through the lens of ‘hybridity and resilience’ as examples where religious transformation was imposed by force (Thomas et al. 2017). The suite of geoarchaeological techniques applied to these sites enables the development, use and abandonment of settlements and fortified sites, and changes in agriculture and land-use to be examined at high resolution, specifically the meso- and micro-scales by comparing data from the buried archaeology with sediments recovered and analysed from the castle hinterland.

We examine what role geoarchaeology has in heritage management of castle landscapes. We argue that the links between on-site activities and those in the hinterland that are revealed by using geoarchaeology are important for assisting with defining the castle landscape itself, presenting the past to the public, and incorporating the hinterland into management decisions for the standing remains while situating these decisions in the political context for heritage legislation for Estonia, Latvia, Poland and Spain. Geoarchaeology allows the preservation conditions of the buried archaeology to be assessed to inform these decisions, and provides an important strand of research when used with other sources of environmental evidence, such as faunal remains, plant macroremains, and palynology studies, to reconstruct the environmental history of a castle’s hinterland.

- 3

POST-ROMAN ‘CASTLESCAPES’ IN NORTHWESTERN IBERIA: AN ARCHAEOLOGICAL OVERVIEW OF HILLFORT OCCUPATIONS

**Abstract author(s):** Tejerizo, Carlos (Universidad del País Vasco) - Rodríguez, Celtia (Universidade de Santiago de Compostela)

**Abstract format:** Oral

The dismantling of the Roman Empire in Western Europe supposed a moment of major changes which included deep transformations in the organization of settlement patterns and, therefore, the constitution of social landscapes. One of the most significant in terms of the latter was the occupation -or the re-occupation- of hillfort settlements during the late 4th and the 5th century. Moreover, this specific phenomenon developed a particular historiographical debate in northwestern Iberia, where the Prehistorical phases of these sites centered most part of the discussions, commonly considering post-Roman occupations as ‘residual’. However, recent excavations, researches and deep reviewing of the stratigraphical sequences of some of these hillfort occupations have challenged traditional views on the topic regarding cultural deterministic explanations into more complex social narratives. From our point of view, we should consider this phenomenon in relation with the deep transformation of the Late Roman elites and the reconfiguration of their power in a moment where the Roman state is no longer stable and useful for their agencies. Thus the emergence of a post-Roman ‘castlescape’ in order to secure their interests over the local communities and the landscapes. In this paper we will present the first analytical overview of this phenomenon, dealing not only with the available archaeological evidence in northwestern Iberia in general, but also focusing on the territorial particularities of hillfort occupations.
- 4

NEW PERSPECTIVES IN THE STUDY OF THE LATE MEDIEVAL JEWISH QUARTER OF LORCA CASTLE (MURCIA, SPAIN)

**Abstract author(s):** Eiroa, Jorge (Departamento de Prehistoria, Arqueología, Universidad de Murcia) - González, Jose (University of Murcia) - Martínez, Andrés (Museo Arqueológico de Lorca) - Celma, Mireia - Molina, Isabel (University of Murcia)

**Abstract format:** Oral

The excavation of the castle of Lorca (Murcia) in the last fifteen years has brought to light a complete Jewish quarter of the fourteenth and fifteenth centuries. The project developed from the University of Murcia has also allowed us to reconstruct daily life on the Castilian-Nasrid border and to define some archaeological indicators for the identification of Jewish medieval populations. In the last phase of the project, re-started in 2020, special attention has been given to the reconstruction of the landscape associated with the castle. The first bioarchaeological results obtained through organic residue analysis, zooarchaeology, carpology and anthracology are being compared with the information provided by the written sources and the rest of the archaeological information. Together, they provide much information on the exploitation of the natural environment in the context of the border and on the characterization of the late medieval Jewish communities. The results confirm the success of a strategy for analyzing the archaeological record of castles from an interdisciplinary perspective.
- 5

CASTLESCAPES IN CENTRAL SICILY IN MEDIEVAL AGE

**Abstract author(s):** Patti, Daniela (University of Enna)

**Abstract format:** Oral

In the study of the landscape the castles, precisely because emerging and multi-layered sites, naturally equipped and inextricably linked to the orography of places, have a central role in the settlements network that in many towns of this area is connoted, precisely, of the characteristics of the rock settlement.

The central Sicily (EN) has considerable archaeological potential, mainly linked to the impressive scenery rocky habitat, known since Ancient times.

If the cave represents an important land marker in the settlement dynamics in this area since Antiquity, the castle, often on pre-existing fortified rock sites, becomes a fundamental element connoting even today the rural and urban landscape.

Is evident the great connection between these castles and network of roads connected to the main traffic routes known by the Ancient sources, to the viability of the Late Antiquity and Mediaeval age, characterized by a dense network connection of these castles, fortress and defensive structures that are scattered in the territory and still visible today in the ruins of the Medieval Age.

In Medieval Age, Sicily becomes one of the privileged places of religious coexistence in the Ancient Mediterranean: Christianity, Paganism, Judaism and Islam coexist and interact creating new forms of settlements dynamics.
- 6

LANDSCAPE OF A ROYAL RESIDENCE – SETTLEMENTS, MATERIAL CULTURE AND ENVIRONMENT AROUND THE TATA CASTLE (HUNGARY)

**Abstract author(s):** Kovács, Bianka (Institute of Archaeology, Research Center for the Humanities) - Gyulai, Ferenc (Szent István University, Institute of Nature Conservation & Landscape Management) - Merkl, Máté - Schmidt-mayer, Richárd (Kuny Domokos Museum, Tata) - Szilvási, Katalin (Szent István University, Institute of Nature Conservation & Landscape Management)

**Abstract format:** Oral

The estate of Tata became the property of King Sigismund /1387-1437/ in 1397. Soon he had built a castle in the area, which was a summer resort of Hungarian kings and a favoured residence during the 15th century. The area was marshy in the Middle Ages,

- 7

BORDER CASTLE IN MUSZYNA – INTERDISCIPLINARY STUDIES

**Abstract author(s):** Ginter, Artur (Institute of Archaeology, University of Łódź) - Ginter, Judyta (University of Łódź)

**Abstract format:** Oral

The first stronghold in Muszyna, located on the border of medieval Poland and Hungary, was built in the 14th century. Situated at the top of an impressive mountain range, it defended both the city located in the valley and the important trade route with the related river crossing of Poprad. It was also the first point of resistance for the enemy who wanted to break into the Lesser Poland from the south.

The location of the stronghold was so good that the bishops of Kraków ruling the area built a magnificent castle in the vicinity. For decades he defended access to the borders of the Polish state, but at the same time, due to the considerable distance from the capital city of Kraków, it became the seat of marauders robbing the Hungarian population.

As a retaliation in 1464 the castle with the stronghold and whole city was destroyed by the Hungarian army under the command of Tomasz Tarczay. It was rebuilt in the style of renaissance, but due to its mountain location in the sixteenth century it lost its importance in favour of the episcopal court built in the city.

Within a period from the 17th to the 19th century, the castle systematically fell into ruin. Currently there are plans for its reconstruction. In order to restore the castle landscape, many years of interdisciplinary archaeological, architectural, archeozoological, historical, geomorphological and analysis of LIDAR data were carried out, thanks to which it was possible not only to determine the time of erection of both defensive objects, but also how they were built and how they were functioning over the centuries.
- 8

INTERDISCIPLINARY INTERPRETATION OF ANTHROPOGENIC LANDFORM RELICTS AROUND THE DESERTED CASTLE (PUSTÝ HRAD) IN ZVOLEN (SLOVAKIA)

**Abstract author(s):** Beljak Pazinova, Noemi (Constantine the Philosopher University in Nitra) - Beljak, Ján (Archaeological Institute of the Slovak Academy of Sciences)

**Abstract format:** Oral

National Cultural Monument Deserted castle (Pustý hrad) in Zvolen lies at the southwestern edge of the town of Zvolen in Central Slovakia, in the famous medieval outskirts of the Zvolen Forest. Medieval builders used the natural properties of the site and built the Upper castle with an area of 3.5 ha on the hilltop (571 m a. s. l.) and 100 m below, they located the Lower castle (0.7 ha). Together with the so-called connecting part, they cover an area of 4.7 ha. The Deserted castle is dated to the last decades of the 12th century. The greatest boom experienced the castle in the 13th and 14th centuries with its gradual dissolution in the beginning of the 15th century. We want to draw attention to various anthropogenic relics (ramparts, hollow ways, roads, quarries...), which we gradually discovered in the forest terrain by field research around the castle. Historical forms of relief have high temporal stability and they are of great importance in the research of the genesis of cultural landscapes. The discovered anthropogenic landform relicts are mainly related to the transport and defense activities of the medieval castle and its background. The results can be used to determine the shape and position of historical relics of anthropogenic relief in a forest environment where classical terrestrial mapping methods are difficult to apply, mainly due to difficult terrain access. The aim is also to enrich the existing knowledge of the economic background of medieval castles. Finally, the analysis can also contribute to the location and comparison of accuracy of historical relics in maps and in the field using both classic and new measurement approaches. Emphasis will be placed also on dating and interpretation of detected features.

This work was supported by the Slovak Research and Development Agency under the contract No. APVV-17-0063.
- 9

ROKŠTEJN CASTLE LORDSHIP – ONE CASTLE, ONE CASTLESCAPE?

**Abstract author(s):** Mazackova, Jana - Vaněčková, Daniela - Žaža, Petr - Púčať, Andrej (Masaryk University)

**Abstract format:** Oral

Castle landscapes represent a myriad of social, economic, architectural and natural relations. The inner economics and economy of any castle are always very hard to piece back together to create a whole picture of a life long gone. Especially from an archaeological perspective. Long-term excavation can reveal many important details, which may have not been previously thought of. Rokštejn Castle (Czech Republic, Jihlava district) has been excavated for over 40 years. Archaeological field prospection of the Castle’s hinterland made it possible to compare the Castle and its hinterland from the economical view. These economic ties are based on

archaeological data and written sources, as well as its ties to the surrounding landscape. The economic situation of the hinterland brings new details, when compared with Castle’s dispositional evolution and changes during individual building phases from the late 13th century to 1467. Thanks to written sources, archaeological and historical research, interdisciplinary approach (e.g. archaeo-botany, petroarchaeology), a complex view of the Castle’s landscape has emerged.

10 THE NOBILIARY FORTIFICATION FROM UROI (MUNICIPALITY OF SIMERIA, HUNEDOARA COUNTY, ROMANIA)

**Abstract author(s):** Codrea, Ionut (Muzeul Civilizatiei Dacice si Romane)  
**Abstract format:** Oral

The Mureş Valley was one of the most significant communication and trade routes of medieval and pre-modern Transylvania. A series of fortifications, each with its own role in accordance to location or political importance, were built on the banks of the respective river. 13 fortifications are known in the county of Hunedoara, five of them being constructed along the aforementioned valley during the 13th-16th centuries: royal, voivodal or nobiliary citadels.

Amongst these, the current paper brings forth the research of the Uroi fortress, one of the almost unknown monuments in Transylvania. The fortification was erected sometimes in the first half of the 16th century. It is located in the area where the Strei River flows into the Mureş River, close to the road which crosses from Țara Hațegului south to north (one of the routes preferred by the Ottoman troupes for invading Transylvania from Wallachia). The first known owners are Macskási Ferenc of Bokaj and Gáspár, his nephew, while in the next century the court and the domain would become the property of the Kapi family. The will of Kapi András from 1634 informs us that he performed a series of changes to the defensive system (bastions, ditches, outer and inner stone walls). In 1659 the fortress was the property of Kapi György, comes of Hunedoara County. There is no information on the circumstances and exact date of the fortresses’ destruction, but we know that this event occurred at the beginning of the 18th century.

In this phase of the study we propose the valorisation of the documentary and narrative sources, but also the information resulted after the corroboration of the non-invasive and topographic surveys. A first outcome would be the integration of the Uroi fortress in the cultural landscape of Transylvania during the Principality.

11 TIMBER CASTLES AND FORTIFIED MANORS FROM THE TERRITORY OF PODLACHIA (NORTH-EASTERN POLAND). A REGIONAL FEATURE OF LANDSCAPE?

**Abstract author(s):** Karczewski, Maciej (Faculty of History and International Relations)  
**Abstract format:** Oral

One of the characteristic features of the archaeological landscape of today’s North-Eastern Poland are earth mounds and shafts predominantly recognized as relics of Early Medieval fort-hills. In fact, despite the similar appearance of the relics, they are remains of different defensive structures (Early Medieval fort-hills, Medieval castles and historical manors) reflecting different historical periods, as well as different social and economic realities. They are connected with the history of studied area from the Early Middle Ages until the 17th or 18th century. At the beginning it was a frontier area between Masovia, Rus and Prussian and Jatviangan tribal territories. After the Teutonic conquest of Prussia – it became the borderland of the Duchy of Masovia (then the Kingdom of Poland), Lithuania (then the Great Duchy of Lithuania) and Teutonic State in Prussia (then the Duchy of Prussia).

Some Early Medieval fort-hills built at the area of Podlachia, during the time of ducal law (11th-12th centuries) still existed along the feudal period as castles, without any change in placement or defensive structures. In the 16th century timber fortified manors of nobles and parsons appeared in the cultural landscape of studied area. In turn, the testimonies of wars fought here in the 17th and early 18th century are relics of military camps in the form of earth embankments and moats. All these relics belong to different layers of the past cultural landscape and can be identified and read only by the multidisciplinary approach, including excavation and the non-invasive archaeological methods, analysis of historical sources and methods of environmental and Earth sciences.

Possibilities and results of studies on timber castles and fortified manors in the historical landscape will be presented on the several examples of investigation of “fort-hills” in the villages of: Bielsk, Grodzisk, Krzeczkowo and Suraż (Podlachia).

a. REIMAGINING THE FINNISH CASTLESCAPE -- THE 16TH CENTURY FORTIFICATIONS OF TURKU CASTLE

**Abstract author(s):** Paukkonen, Nikolai - Vidgren, Jani (Muuritutkimus Oy) - Knuutinen, Tarja - Uotila, Kari (Muuritutkimus Oy; University of Helsinki)  
**Abstract format:** Poster

Muuritutkimus company conducted an archaeological excavation in front of Turku Castle’s outer bailey during the late autumn of 2019. Turku Castle is one of the oldest buildings still in use and by far the largest surviving medieval building in Finland. Thus it stands as an iconic piece of Turku landscape today, defining the scenery and attracting tourists. Although the Castle itself has been well studied in the past, the area outside the bailey has remained previously unexcavated.

The results of the excavation and an integrated GPR analysis of the area revealed the remains of a 16th to 17th century earth rampart and ditch construction, none of which was visible on the surface level, which is a flat recreational park today. Our results in cooperation with the research of old archive materials and maps give us a picture of how these fortifications and other structures outside the castle and its outer bailey would have been situated and how they might have looked like.

This paper explores a neglected phase of the castle’s visual image. The earthen ramparts of the 16th century and the later 18th century bastion fort would have made the area look significantly alien compared to its modern appearance. The structures would have also included the habitation for craftsmen and other workers related to the daily life of the castle. In addition to this, the effects of post-glacial rebound have altered the shoreline tremendously. In the light of these findings, the castlescape of the 16th century Turku would have looked radically different from what it is today.

b. HOW FAR DOES THE CASTLE EXTEND? AND WHAT BELONGS TO IT?

**Abstract author(s):** Miskolczi, Melinda (Herman Otto Museum)  
**Abstract format:** Poster

The poster examines the Castle of Diósgyőr, located in Borsod-Abaúj-Zemplén county, in the North-Eastern region of Hungary. The castle – built in the 14th century – never held any significant strategic value. Diósgyőr was one of the favored residences of the royal court between the 14th and 16th centuries, also being one of the estates of the Hungarian queens.

The castle situated on a conic boulder. At the end of the 1960s had finished the stronghold’s archaeological examination. The castle’s wider surroundings, however, are still full of questions. Answering these can be difficult, given the urban environment. The archaeological exploration has restarted from the early 2000s, although with some breaks. These focused more on the broader surroundings, concentrating on complex questions. Answering these would help to specify the everyday life of the castle, and the layout of segments previously only known from historical sources.

The poster wants to bring attention to the following topics:

- How did the water get into the moat? What was the source of it?
- What economic role could the ditch of the Castle of Diósgyőr have had?
- The historical sources mention the „bathhouse of the queens.” Where could it be?
- How big was the ground-space of the Castle of Diósgyőr in the Middle Ages?

63 THE ARCHAEOLOGY OF THE SKY

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Organisers:** Pasztor, Emilia (Türr Istvan Museum; International Society of Archaeoastronomy and Astronomy in Culture) - Frincu, Marc (West University of Timisoara Romania, Faculty of Mathematics and Computer Science; Romanian Society for Cultural Astronomy)  
**Format:** Regular session

There is no culture in the history of humanity that has not noticed the spectacular and/or regular phenomena in the sky. The particularities these ancient people observed left a strong mark on their society.

These observations later became part of the practical experiences necessary to everyday life as well as the beliefs guiding their society. Hence, their impact can be detected and therefore, should be studied in the material culture. The archaeology of the sky – or archaeoastronomy as a sub-discipline of archaeology – plays an important role in providing particular information on the relation of ancient cultures to the natural environment. When studying the past, the task is not only to discover, classify, and describe the findings but also to investigate what people thought and experienced of the world around them, and how they imagined its origins and functioning. To achieve this objective, archaeoastronomy, as a scientific discipline, can offer new narratives for understanding the past through inter- and cross-disciplinary approaches, complementing and at the same time relying on archaeology, history of science and arts, ethnology, and ethnography.

This session is intended to illustrate the benefits of applying archaeoastronomy in archaeological research and interpretations.

We expect case studies, theoretical discussions that present new insights, challenge existing paradigms in archaeology, and emphasize the importance of archaeoastronomy in uncovering the past by enriching the context with valuable information otherwise not accessible to an archaeologist or historian.

ABSTRACTS

1 THE ARCHAEOLOGY OF THE SKY - INTRODUCTION

**Abstract author(s):** Pasztor, Emilia (Türr István Museum, Baja; International Society of Archaeoastronomy and Astronomy in Culture)  
**Abstract format:** Oral

The most important statement in cultural ecology is that the natural environment has a significant impact on societies and cultural institutions. However, the natural environment includes not only the earth under us, but also the sky above us. The day and night sky with its real and apparent elements. Thus, a community is also influenced by elements of the celestial landscape, the traces of which must be found and therefore studied in material culture.

The question is, therefore, what archaeological evidence shows the impact of celestial ‘landscape’ in an archaeological culture. Such



2 studies may focus on discovering ancient astronomical lore and/or mapping the influence that the sky and its phenomena may have on the life and worldview of an ancient community. As the task of the archaeologist is not only to discover, classify and describe the finds, but also to investigate what people thought of the world around them, how they imagined its creation and functioning.

Anthropological analogies clearly demonstrate how rich and complex this effect could be. Sky lore had social and spiritual power. In the presentation the author offers archaeological case studies that clearly prove this statement. Thus, these "road signs" point the way for the future and also highlight that research opportunities are much richer and more complex than just exploring orientations. It would be professional irresponsibility to ignore it.

## 2 WATCH THE SKY!

**Abstract author(s):** Lorin, Yann (Inrap - UMR 8164 Halma)

**Abstract format:** Oral

This paper proposes a descriptive study of the major themes represented on non-figurative Bronze Age ceramic sets. It considers the hypothesis of a thematic relationship between these motifs and the representations of protohistoric cosmogony. A large iconographic corpus is considered in this approach as a documentary source for a better understanding of our archaeological furnitures. The examination focuses in particular on characterising the recurrent themes addressed in the iconography and identifying the modes of expression used. This analysis reinforces the cosmogonic interpretations concerning the major themes addressed by the protohistoric imagination. The analytic approach adopted opens up hypotheses about the meaning of forms, whether figurative or abstract, and this interpretation makes it possible to address the question of narrative and modes of narration.

The sky represents an elsewhere. It is the subject of metaphor and objects from the material sky inhabit the imaginary sky. Secondly, we will examine the parallel between cosmogonic narratives and the observation of atmospheric phenomena such as solar halo or parhelia.

## 3 DERIVED FROM THE SUN – HORSES, SWANS AND WHAT ELSE?

**Abstract author(s):** Mrenka, Attila (Museum of Sopron)

**Abstract format:** Oral

In certain cases, the archaeologist had an easy task. Dug out, wrote down, publish.

While in other cases, the situation could be more complex. Many of our superstitions can be traced back to the Iron Age. Taboos and beliefs are points to a certain horizon of time.

At the time of the Central European Late Bronze Age a strange kind of Sun reality (Sonnenwirklichkeit – as Stefan Wirth formulated some years ago) is clearly detectable. As time went by and the world changed slightly and by the time of the Early Iron Age the Sun symbols that had long ago existed suddenly disappeared. Or we believe it so. Certainly that is not the case. The same population had lived continuously in that area from the Late Bronze Age to the Early Iron Age therefore we have to find an explanation why their symbolic "language" changed a lot in such a short period of time.

I try to shed light on this question from the perspective of the Hungarian Early Iron Age, especially from the finds of Sopron – Burgstall.

## 4 REVISITING SEVSAR: TOWARDS A POSSIBLE GNOMON IN THE ARMENIAN HIGHLANDS

**Abstract author(s):** Frincu, Marc (Romanian Society for Cultural Astronomy; Department of Mathematics and Computer Science, West University of Timisoara) - Perez-Enriquez, Raul (Departamento de Física, Universidad de Sonora) - Aghikyan, Levon (Institute of Archaeology and Ethnography)

**Abstract format:** Oral

The Armenian highlands contain numerous remote petroglyph sites. While many are pastoral depictions of animals, others are more abstract and complex. One example is found on Sevsar mountain at about 2700 m altitude. The site is isolated, and no other nearby sites are known. Archaeologists believe it to be from LBA period. The only existing theory about the abstract carvings dates from the 80s when it was believed to represent a lunar and solar calendar. During our two expeditions to the site (2017 and 2019) we noticed the strange orifice in its great circular petroglyph, deep enough to hold a vertical wooden pole. Its intricate design with a spiral radiating from it and three concentric circles placed at non-equidistant radii from the center made us consider its possible use as a sundial with the circles representing the noon shadow lengths on solstices and equinoxes. Our interdisciplinary analysis shows that the dimensions of the petroglyph closely matches actual shadow lengths in LBA, and that the petroglyph can be reconstructed with high accuracy from theoretical eclipses. Together with its remote location this indicates a high level of knowledge of the builders and a possible ritualistic as well as initiatic destination.

## 5

## AN ARCHAEOASTRONOMICAL PERSPECTIVE ON TWO SIMILAR LBA TUMULUS NECROPOLISES FROM ROMANIA

**Abstract author(s):** Dorogostaisky, Alexandru (Romanian Society for Cultural Astronomy - SRPAC; Arheo Vest NGO) - Frincu, Marc (West University of Timisoara, Faculty of Mathematics and Computer Science; Romanian Society for Cultural Astronomy - SRPAC; European Society for Astronomy in Culture - SEAC) - Rogozea, Octavian (West University of Timisoara, Faculty of Letters, History and Theology; Arheo Vest NGO)

**Abstract format:** Oral

The two sites are situated in the Carpathian Basin.

The Lapus – Podanc necropolis is an LBA site which was used for about 200 years in the 14-12 centuries BCE. It comprises of 45 tumuli spread over 20 ha. From the Lapus – Podanc site the summer solstice sunrise is aligned with the pyramid-shaped Hudin Peak and the sunset is aligned with the trapezoidal-shaped Satra Pintii Peak. The double alignment significantly increases the statistical chances for an intentional placement of the necropolis. It is hence likely that the sunrise and sunset during summer solstice played an important role in the funerary rituals at Lapus,

The first tumulus from Susani – Gramadura lui Ticu is interpreted as an offering's altar and deposit for vases (around 250 have been found, some exhibiting stellar symbols) from the LBA period. In its area there are 3 tumuli, two other being currently excavated.

During winter solstice sunrise occurs from behind the Pades Peak. However, the distribution of bronze age settlements in the area, the placement of the site at the crossing of two major valleys in the area, as well as the fact that the alignment is not precise (it does not occur exactly from behind the mountain peak – which cannot be dismissed as prehistoric alignments are mostly ritualistic and not precise mathematical constructions) seems to point that astronomy was not the sole reason for choosing the location.

In our studies, we simulated based on photographic imagery, and compass and clinometer measurements the sunrise and sunset during LBA using the Cartes du Ciel and Stellarium v.0.19 astronomical software.

The two presented cases add value to the archaeological landscape by attempting to establish the vast context of the solar ritual rite in LBA from an astronomical perspective. As such archaeoastronomy joins other non-invasive methods. approaches.

## 6

## MEGALITHS ON ISLAY, SCOTLAND: AN ISLAND DIVIDED.

**Abstract author(s):** Higginbottom, Gail (El Instituto de Ciencias del Patrimonio - Incipit, CSIC) - Mom, Vincent (Digital Preservation Projects)

**Abstract format:** Oral

In Higginbottom 2020, it was shown that the interplay between the astronomy and the topographical choices of the builders of megalithic monuments highlighted possible cosmological ideologies that could be observed and seemed to be shared across western Scotland. More focused studies showed how prehistoric people in Scotland used the differences in natural light to illuminate the World around them and demonstrated how Time was 'staged' by prehistoric people at particular periods during the solar and lunar years (Higginbottom & Mom 2020). Nevertheless, one of the most curious set of results to come out of the earliest landscape research on Islay was the complete lack of interest in orienting any of its monuments to the winter Sun, which had not been the case for the other islands of the Hebrides, nor the coastal mainland. Further, for this island, there was significant statistical support for a disinterest in orienting the standing stones to any solar target. More recently, on closer examination, not one site in the initial group of monuments studied on Islay was aligned to the Sun, again unlike other places in the region regardless of the statistical emphasis. What had been seen was statistical support for alignments to the Moon's rising and setting at the time of the minor lunar standstill (p=0.005 when seen on the northern horizon and p=0.05 for southern phenomena) as well as a focus on horizon areas that flank the points where the Sun rises and sets at the Equinox (p<0.1). Using our usual integrative, immersive technologies, Horizon and Stellarium, we will present images of past skies at individual monuments to re-investigate the raw data of these statistical analyses, along with data from new sites, to uncover more clearly whether or not Islay is truly a place apart in the Bronze Age of Western Scotland.

## 7

## ASTRONOMICAL OBSERVATIONS AT MACHU PICCHU (PERU): FACTS, HYPOTHESIS AND WISHFUL THINKING

**Abstract author(s):** Ziolkowski, Mariusz (Centre of Precolumbian Studies, University of Warsaw) - Kościuk, Jacek (University of Science and Technology of Wrocław)

**Abstract format:** Oral

This paper presents a summary of the studies in archaeoastronomy carried out by the Authors since 2012 in the Machu Picchu National Park (Peru). The possible astronomical function of some of the structures of the Llaqta of Machu Picchu, in particular the Intihuatana, the Torreón or the Intimachay cave had been postulated years ago, by several specialists. In effect of the Authors' work, it has been possible to confirm, and even expand, the previous hypotheses about the Intimachay function. A unique object, the Mirador de Inkaraqay, has also been analyzed. This structure turned out to be built solely for the purpose of astronomical observations of the Sun, of the Moon, of the Pleiades and, possibly, of Venus. But on the other hand, some of the hypotheses about other objects, such as Intihuatana or Los Espejos (the Mirrors) turned out to be very debatable and uncertain. This last critical consideration concerns in particular the hypothesis of a long-distance Inca planning, whose purpose would have been to align several ceremonial sites, between these Machu Picchu, along a straight line, astronomically oriented, starting from Cusco.

8 A MAJOR SUCCESS FOR THE PRINCIPLES OF ARCHAEOASTRONOMY: INTERPRETING THE PLANNING OF THE STONE CIRCLES OF IRELAND AND BRITAIN

**Abstract author(s):** Meaden, Terence (Oxford University)

**Abstract format:** Oral

Understanding the meaning of Irish and British stone circles of the Neolithic and Bronze Age has puzzled archaeologists and astronomers for over two centuries. This paper reports that a solution has been found by approaching the problem from the point of view of archaeoastronomy and symbol interpretation. Almost 60 stone circles in Ireland, a dozen in Scotland and a dozen in England have so far been solved. Interpreting the intelligence behind the design of Drombeg Stone Circle was the catalyst for finding the solution, so this is being treated as a type-site. The key factors are that Drombeg, like every such circle, has a focal stone on its western perimeter from the middle of which are alignments to a series of positioned stones and the rising sun in the east. Crucial is that five well-placed stones on the eastern perimeter account for all eight ancient agricultural festival dates. If the date of the winter solstice is designated as Day 1, the other dates follow at 45 or 46-day intervals. These are the four familiar quarter days (two of which are solstices) and the four cross-quarter days. Besides the date recognitions, at many sites at times of clear-sky sunrise a shadow from each eastern stone, depending on date, arrives at the middle of the stone waiting in the west. Often, the reception stone is an axial recumbent stone. At Drombeg the recumbent stone has a vulva carved on it, while in the east one of the tall, narrow, shadow-casting stones bears a carved ithyphallus. This implies that these stones symbolically indicate female and male genders—hence their dramatic watchable union by shadow at sunrise. These are logical aspects of a fertility religion, noting that the successful fertility of crops, domesticated animals and women is obviously essential for the hard-working farming communities.

9 SKYSCAPE ARCHAEOLOGY: BRIDGING THE GAP BETWEEN ARCHAEOASTRONOMY AND ARCHAEOLOGY

**Abstract author(s):** Henty, Ann (University of Wales Trinity Saint David; Journal of Skyscape Archaeology)

**Abstract format:** Oral

Historically the fields of archaeology and archaeoastronomy have been divided despite their mutual interest in monumental heritage. The reasons for this divide stem from their different theoretical perspectives, methods and skill-sets together with their split between ground-based and sky-based preferences. Yet a combination of both has been shown to provide new insights for both single and multiple sites, resulting in new interpretations which can be tested at other similar sites. Skyscape archaeology, first proposed by Fabio Silva and Liz Henty in 2014, bridges the divide by thoroughly exploring and combining data obtained by both archaeological and archaeoastronomical methods and fieldwork, to propose a holistic methodology which also includes a phenomenological and reflexive approach to new research. The advantages are obvious though most archaeologists and prehistorians have been slow to consider the cultural impact of the skyscape in their investigations and fail to understand the sky symbolism embedded in monumental constructions. To explore the advantages of skyscape archaeology and how it can be put in practice, this paper combines the data from Richard Bradley’s archaeological investigation of Tomnaverie Recumbent Stone Circle in north-east Scotland and my archaeoastronomical research to show how the results open up the possibility of a new conversation between both archaeoastronomers and archaeologists. The aim of skyscape archaeology is to encourage a new approach whereby archaeology and archaeoastronomy can supplement each other’s narrative and bring the sky back to archaeology. The case study of Tomnaverie highlights the beneficial advantage of interdisciplinary or multidisciplinary collaboration and shows how skyscape archaeology can help heal the historical divide between archaeology and archaeoastronomy by combining existing methodologies.

10 HAT ROCK AS A POSSIBLE SUN SHRINE DURING THE LATE BRONZE AGE AND EARLY IRON AGE PERIOD

**Abstract author(s):** Mitre, Zoltan (Institute of Geography and Earth Sciences, Faculty of Sciences, University of Pécs) - Ilon, Gábor (Freelance archaeologist)

**Abstract format:** Oral

During the Late Bronze (14th-8th century BC) and Iron Age period (7th-1st century BC) on the top of the Szent Vid hill in the Hungarian Kőszeg-mountain, next to the Amber Road edge along the valley of Gyöngyös river, there was a significant settlement, also a power, industrial and trade center. The Hat Rock is a cliff group of natural origin with a distinctive morphology situated approximately two and a half kilometers from this place, above Bozsok village. Presently Szent Vid hill is still clearly visible from this place. Archaeological research in both places during the last decades presumed the possible astronomical-related use of the Hat Rock, primarily related to the Sun. At the south part of the cliff group, in a leeward place suitable for shelter too, an archaeological excavation found a fire place and potsherds, clay spoon, grindstone from the Late Bronze - Early Iron Ages. Based on the geodesy data of the territory of Hat Rock, we found its south-east, north-west direction, which coincides with the direction of the sunrise of the winter solstice and the sunset of summer solstice. In the inner place of the area, among the items of rocks at the highest position, we can determine places, where the approximate Sun positions of summer and winter solstices can be appointed with cliff items. Observation of night sky from here also can help the forecast of times of this Sun positions.

11 THE ENIGMA OF THE CAROLINIAN SIDEREAL COMPASS

**Abstract author(s):** Anyiszonyan, Artur (ELTE, Faculty of Science, Department of Astronomy)

**Abstract format:** Oral

Stellar heaven used to be a fundamental navigational tool for many seafaring communities of the Pacific during millennia. Various forms of astronomical lore had been developed and refined by many generations of navigators, most of which became eradicated almost completely by the social change induced by colonisation. The Caroline Islands are one of those few places where autochthonous navigational knowledge survived more or less intact up until today.

The basis for the Carolinian system of navigational knowledge is the sidereal compass, a mental construction which settles geographic directions by means of rising and setting points of certain stars. During the 20th century, several investigators gathered firsthand information about the sidereal compass. However, their accounts contain severe contradictions, signalling a profound misunderstanding. In the 1990s, an attempt was already made to overcome the difficulties by introducing a new interpretation of the sidereal compass, but the result is not convincing.

The aim of the present talk is to provide a better understanding of the basis of Carolinian navigation, i.e. to present an interpretation of the sidereal compass which is closer to the ideas of Carolinian navigators.

12 ANYTHING ELSE WE CAN LEARN ABOUT MEDIEVAL CHURCHES?

**Abstract author(s):** Caval, Saša (University of Reading)

**Abstract format:** Oral

Christian churches have been studied within various subdisciplines of archaeology, for example, Church archaeology, Roman archaeology, Biblical archaeology, Medieval archaeology, Archaeology of religion and many more, as well as within multiple histories. All mentioned disciplines wrestle either written sources or material culture, including architecture itself. The character of religion is such that the intangible of a belief is easy to adopt and accept, but hard to prove. Correspondingly, it is the character of archaeology and history for them to become inadequate when attesting the fundamental yet immaterial elements of the past faiths. However, the methods of archaeoastronomy have been drawn from hard sciences to (re) create scientific experiments that offer views into the intangible components of viewpoints, ideas, philosophies and in particular of beliefs, faiths and religions. This paper will present several intangible elements of Christianity in medieval Slovenia that were teased out from the church material culture through archaeoastronomical analyses.

13 PORTARA FROM NAXOS - THE CELESTIAL GATE

**Abstract author(s):** Bajic, Aleksandra (Archeoastronomy)

**Abstract format:** Oral

Portara is a monumental gate on Naxos, built by the end of VI century BC, by the local ruler Ligdamis, as the entrance of an unfinished temple. Some scientists think that the temple was dedicated to Apollo, others attribute it to Dionysus. Here, we attempted to contribute to the resolution of this dilemma, using the methods of Archeoastronomy. We demonstrated that Portara does not face Delos, which was the important argument for the claim that the temple was dedicated to Apollo. Also we investigated the visibility of Corona Borealis, Lyra and Cygnus through the opening of Portara in connection with festivals of Dionysus and Apollo. Our findings support the possibility that three festivals were planned to be celebrated in the temple with Portara: Metageitnia (dedicated to Apollo) and two winter festivals, Rural Dionysia and Lenaia (both dedicated to Dionysus).

14 DELOS, THE CENTER OF APIOLLO’S CULT – AN ARCHAEOASTRONOMIC PERSPECTIVE

**Abstract author(s):** Bajic, Aleksandra (Archeoastronomy)

**Abstract format:** Oral

Delos is a small island in the centre of the Cycladic group. It has neither enough water nor enough arable land to produce enough food for its inhabitants. Despite these facts, the island was chosen to be the cult centre of Apollo, the very significant deity of the Greek pantheon. In this paper, rational reasons are sought for why such an inhospitable place, where there is no reason for people to stay longer, was chosen for such an important role. The position and orientation of the main Apollo’s temple at the island were analysed. The results showed that the axial orientation of the temple is suitable for observing the setting of the constellation Corvus (Raven), which is certainly related to the mythology of this deity. Gnomonic factors at the island were also analysed, i.e. the relation of the height of the gnomon and the length of its shadow, especially on the days of some important Apollo’s holidays and on the cardinal days of the year (solstices and equinoxes). The results show that the geographical latitude of the island was very suitable for compiling a solar calendar using the help of a gnomon and observing certain constellations. This could be an important criterion in choosing the location of the sanctuary.

RECONSTRUCTING FAUNAL EXPLOITATION PATTERNS, PALAEOECOLOGIES AND LIVING LANDSCAPES OF THE PLEISTOCENE [PAM]

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Organisers:** Jones, Jennifer (IIIPC, Universidad de Cantabria) - Smith, Geoffrey (Max Planck Institute for Evolutionary Anthropology)  
**Format:** Regular session

This session aims to explore different bioarchaeological approaches used towards understanding the complex interactions between humans and animals in the past. Changes in climate, environment, demography, and human activity all affected the behaviour and distribution of fauna, directly impacting on the subsistence strategies used by humans in the past. This is particularly pertinent when considering the Pleistocene, when fluctuating climatic conditions affected the distribution and migration patterns of wild fauna affecting the availability of prey species available, and thus hunting strategies employed by past populations. Understanding patterns of faunal exploitation, and animal behaviour in the past and how they changed in response to population and environmental pressures is crucial in being able to understand processes happening in the world today.

Alongside traditional zooarchaeological analyses, which forms the foundation for any investigation of fauna in the past, there is a vast suite of bioarchaeological methods providing additional complementary datasets. Such approaches include; Zooarchaeology by Mass Spectrometry (ZooMS), bulk collagen isotopic analysis, incremental analysis of teeth, aDNA, geometric morphometrics, and behavioural modelling. Integrating these different approaches allows us to answer specific questions about the lives, behaviours, and uses of animals in the past, and the humans that exploited them.

This session welcomes contributions from researchers working in different geographical regions and chronological settings using an array of analytical approaches towards studying faunal exploitation and palaeoecologies in the past. We particularly welcome submissions from researchers that employ multiple different methodologies, and that integrate zooarchaeological, biomolecular, and environmental archaeological approaches towards reconstructing past environments, animal behaviours and hunting strategies during the Pleistocene.

ABSTRACTS

1 INTEGRATING APPROACHES TOWARDS STUDYING PLEISTOCENE PALAEOECOLOGIES, ECONOMIES AND LANDSCAPES

**Abstract author(s):** Jones, Jennifer (IIIPC, Universidad de Cantabria) - Smith, Geoffrey (Max Planck Institute for Evolutionary Anthropology)  
**Abstract format:** Oral

The last few years has witnessed an expansion in the application of biomolecular methods such as stable isotopes, proteomics and ancient DNA to the analysis of human behaviour throughout the Pleistocene. These methods can produce unique datasets that each have the potential to provide additional information about past human subsistence and adaptation. Currently, such datasets are frequently reported separately, though there have been some attempts to integrate these methods with traditional zooarchaeological datasets.

In this session we want to explore some of the key themes relating in Pleistocene subsistence, and bring together researchers using novel, integrative approaches in order to enhance our understanding of human-animal-environment interactions in the past. We will focus on the archaeological potential of using both zooarchaeological and biomolecular approaches to answer key research questions about past subsistence, faunal palaeologies and landscape use.

Alongside site-based case studies, it is important to consider and debate issues such as temporal reconciliation between different methodological approaches, the importance of taphonomy in both understanding depositional and post-depositional processes, and, importantly, how this may impact on any biomolecular analyses undertaken. The importance of accurate quantification of faunal remains, and the role that this has to play in sampling strategies for further scientific analyses, remains a key topic for discussion. Additionally, the interplay between preservation of remains, destructive sampling, and the advance of archaeological knowledge is also a core issue at the centre of archaeological research to date.

Our session will encourage attendees to consider how we can develop new approaches, collaborations, and multi-disciplinary techniques in order to answer archaeological questions about human and animal adaptations to changing Pleistocene environments.

MIDDLE PALAEOLITHIC ENVIRONMENTAL RECONSTRUCTION OF THE VÂRGHÎȘ GORGES AREA (PERȘANI MOUNTAINS, ROMANIA) BASED ON SMALL VERTEBRATE FOSSIL ASSEMBLAGES

**Abstract author(s):** Vasile, Stefan (University of Bucharest) - Petculescu, Alexandru (“Emil Racoviță” Institute of Speleology, Bucharest; Romanian Institute of Science and Technology, Cluj-Napoca) - Dumitrașcu, Valentin (“Vasile Pârvan” Institute of Archaeology, Bucharest) - Cosac, Marian - Murătoreanu, George (“Valahia” University of Târgoviște) - Alexandru, Radu (Culture, Cults, and National Cultural Heritage Office – Dâmbovița) - Vereș, Daniel (“Emil Racoviță” Institute of Speleology, Cluj-Napoca)

**Abstract format:** Oral

The regional trend of climate changes that occurred during the late Pleistocene is generally known, but local environments (such as climatic refugia controlled by particularities of terrain) are more difficult to reconstruct.

The taxonomic composition of small vertebrate assemblages found in cave deposits is a useful tool in estimating local environments. Since the small vertebrate remains usually represent accumulations made by birds of prey, the fossil assemblage can include specimens gathered from areas up to 10 km<sup>2</sup>, from a variety of habitats.

The site Abri 122, a rock shelter continued by a small cave located near the southern end of Vârghiș Gorges (Perșani Mountains, Romania), yielded a large number of Mousterian lithics and large mammal bones, some bearing clear cut marks. Radiocarbon and biochronological dating place the cultural layer towards the end of the Middle Palaeolithic. The fine-grained sediment mixed with limestone boulders making up the infill of Abri 122 yielded numerous mammalian and herpetofaunal fossil remains. As most of the identified taxa are still part of the present fauna, their known ecological preferences can be used to infer the local late Pleistocene paleoenvironments.

The small vertebrate fossil assemblage includes 15 taxa, some of which have marked ecological affinities: the occurrence of *Arvicola amphibious* and *Pelophylax* sp. indicates a permanent water stream was present; *Clethrionomys glareolus*, *Sorex araneus*, and *Rana temporaria* inhabit shrublands or forests; *Lacerta agilis*, *Microtus arvalis*, *Lagurus lagurus*, and *Cricetus cricetus* are typical to grasslands; and *Chionomys nivalis* prefers cold rocky habitats. The small vertebrate fauna indicates a mix of environments was present in the Vârghiș Gorges area during the late Middle Palaeolithic: rocky mountains covered in forests gradually shifting to grasslands as the gorges end and flat terrain covered by thick soil takes over, all crossed by the water stream that shaped the gorges.

3 SUBSISTENCE BEHAVIOUR DURING THE INITIAL UPPER PALAEOLITHIC OF BACHO KIRO (BULGARIA): INTEGRATING ZOOARCHAEOLOGICAL AND BIOMOLECULAR DATASETS

**Abstract author(s):** Smith, Geoffrey (Max Planck Institute for Evolutionary Anthropology) - Spasov, Rosen (Archaeology Department, New Bulgarian University, Sofia) - Sinet-Mathiot, Virginie (Max Planck Institute for Evolutionary Anthropology) - Welker, Frido (University of Copenhagen; Max Planck Institute for Evolutionary Anthropology) - Meyer, Matthias - Vernot, Benjamin - McPherron, Shannon (Max Planck Institute for Evolutionary Anthropology) - Sirakov, Niolay (National Institute of Archaeology and Museum, Bulgarian Academy of Sciences, Sofia) - Tsanova, Tsenka - Hublin, Jean-Jacques (Max Planck Institute for Evolutionary Anthropology)

**Abstract format:** Oral

Excavations at Bacho Kiro Cave during the 1970s revealed a sequence spanning, in its lower part, the change from Middle to Upper Palaeolithic transition (MP/UP). Since then, the cave has been known for its rich faunal assemblages and the stone artefact record from level 11, the so-called ‘Bachokirian’. Due to its Initial Upper Palaeolithic (IUP) character, this record has been critical in the debates about the timing and adaptations of early groups of *Homo sapiens* in Europe.

Since 2015, new excavations of the cave have focussed on the previous excavation area but also on preserved deposits in a new area, Niche-1. Niche-1 has produced considerable lithic (n=2301) and faunal (n=12,500) assemblages from the IUP of Layer I (previously level 11) and upper Layer J, as well as the MP of lower Layer J and Layer K. New radiocarbon ages for Layer I of ~45 ka BP provide highly reliable chronological context of these finds and permit more detailed and integrative investigation of changes in hominin subsistence behaviours within the MP-to-UP context.

This paper presents the first results of our integrative assessment of IUP subsistence behaviour at Bacho Kiro. Our methodology incorporates traditional palaeontological, zooarchaeological and taphonomic information alongside complementary bimolecular data from proteomics and ancient DNA. Detailed zooarchaeological analysis highlights that Layer I accumulated largely through human activities. This contrasts with Layers J and K where the intensity of carnivore modifications of fauna is significantly higher. The IUP deposits reveal broader exploitation of herbivore and carnivore species, which indicates flexibility in adaptation of these early groups of *Homo sapiens* in the region.



4 **DIRECT EVIDENCE FOR CLIMATIC CONDITIONS EXPERIENCED BY INITIAL UPPER PALAEO-LITHIC HOMO SAPIENS AT BACHO KIRO CAVE, BULGARIA**

**Abstract author(s):** Pederzani, Sarah - Britton, Kate (Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig; Department of Archaeology, University of Aberdeen) - Aldeias, Vera (ICArEHB, University of Algarve, Faro; Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig) - McPherron, Shannon (Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig) - Rezek, Zeljko (Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig; University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia) - Sirakov, Nikolay (National Institute of Archaeology and Museum, Bulgarian Academy of Sciences, Sofia) - Smith, Geoffrey (Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig) - Spasov, Rosen (Archaeology Department, New Bulgarian University, Sofia) - Tsanova, Tsenka - Hublin, Jean-Jacques (Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig)

**Abstract format:** Oral

Climatic conditions represent a key variable in shaping the seasonal and spatial availability and distribution of animal and plant resources, having an impact, therefore, on human hunting and subsistence strategies. These impacts are particularly important to reconstruct for the major events of human dispersion in the past and their adaptation to variable environments, such as the mid- latitudes of Eurasia during the Initial Upper Palaeolithic (IUP). While the general suggestion is that these dispersals occurred during the mild climatic conditions of interstadials such as GI 14-13 or GI 12 (e.g. Staubwasser et al., 2018), there is so far little direct evidence for this temporal and climatic correlation, due to difficulties in obtaining higher-resolution climatic proxies directly associated with the IUP archaeological record. This poses a significant challenge for characterising the ecosystems exploited by humans during their dispersion into Eurasia and for contextualizing their behaviour.

Using the example of Bacho Kiro Cave, Bulgaria, we provide direct evidence for the local climatic conditions experienced by the earliest IUP Homo sapiens in Europe and explore how these conditions may have shaped their interactions with the environment. Based on a large data set of sequential oxygen (phosphate) isotope measurements of Bos/Bison and Equus tooth enamel, we reconstruct seasonal (summer and winter) palaeotemperatures for the IUP occupations at the cave and contrast them with the climate of the underlying Middle Palaeolithic (MP) record. This allows for a more concrete contextualization of changes in subsistence behaviours and animal resource exploitation within this IUP-MP sequence. Due to the use of material from the anthropogenically accumulated faunal record of the IUP that is both robustly dated and directly associated with Homo sapiens fossils, we generate temperature estimates for climatic conditions directly connected to some of the earliest human groups in Europe.

Staubwasser et al., 2018. PNAS 115, 201808647.

5 **ESR DATING LATE PLEISTOCENE BALKAN SITES: ESTABLISHING THE MIDDLE TO UPPER PALEOLITHIC SEQUENCE CHRONOLOGY**

**Abstract author(s):** Blackwell, Bonnie (RFK Science Research Institute; Dept of Chemistry, Williams College, Williamstown) - Mihailović, Dušan (Dept. of Archaeology, University of Belgrade) - Mihailović, Bojana (National Museum, Belgrade) - ROKSANDIC, Mirjana (Dept. of Anthropology, University of Winnipeg) - Šalamanov-Korobar, Ljiljana (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - Dimitrijević, Vesna (Dept. of Archaeology, University of Belgrade) - Turk, Ivan (Inštitut za arheologijo, SAZU, Slovenian Academy of Sciences, Ljubljana) - Skinner, Anne (Dept. of Chemistry, Williams College, Williamstown) - Kitanovski, Blagoja (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - PLAŠVIĆ, Senka (Dept. of Archaeology, University of Belgrade)

**Abstract format:** Oral

Dating ungulate teeth archaeologically associated with Middle Paleolithic (MP) assemblages enables one to obtain archaeologically significant absolute dates for MP sites, and compare with other sites to build regional syntheses correlated with local (Divje Babe) and global climatic records (e.g., Marine Isotope Stages, MIS). ESR-dated MP and Upper Paleolithic (UP) layers at Divje Babe, Slovenia, Golema Pešt, North Macedonia, Šalitrena Pečina and Pešturina, Serbia, were compared to track Late Pleistocene hominin populations through the Balkans. In Golema Pešt, at the MP-UP transition, the last Mousterian tools lie >15 cm above the Campanian Ignimbrite Tephra dated at 42 ka, while cervid teeth associated with Denticulate Mousterian tools correlated with early MIS 5a. In Pešturina, Charentian Mousterian assemblages and Neanderthal fossils dated to MIS 5d, predating Denticulate Mousterian layers in MIS 5b-5c. As temperatures dropped, the Gravettian industry appeared in late MIS 3. In Šalitrena, Gravettian artefacts dated at ~24-25 ka by AMS 14C correlated with MIS 2. Aurignacian deposits dated at ~31 ka in MIS 3. By 38-39 ka in MIS 3, the latest Moustერიans disappeared, but first arrived in MIS 5. Thus, living across the Balkans in MIS 5-4, Neanderthals left plentiful thick Mousterian deposits, but abandoned Golema Pešt after 42 ka, but they likely still lived at Pešturina. By 42-36 ka (mid MIS 3), anatomically modern Homo sapiens (AMHs) carrying Aurignacian tools settled the northern peninsula, but the Mousterians had disappeared from the Balkans, because Neanderthals had disappeared or had moved to other Balkan sites not yet discovered. The Gravettian occupation started at 33 ka, but became intensive after 29 ka. More Middle Paleolithic sites must be dated to fill gaps in the Neanderthal's Balkan history and to better understand Neanderthal-AMHs interactions within the Balkans. More sites with pre-MIS 5e deposits are needed to understand the earlier hominin movements.

6 **ESR DATING TEETH ASSOCIATED WITH THE MOUSTERIAN AND NEANDERTHAL FINDS AT PEŠTURINA, SERBIA**

**Abstract author(s):** Blickstein, Joel (RFK Science Research Institute, Glenwood Landing) - Blackwell, Bonnie (RFK Science Research Institute, Glenwood Landing; Dept. of Chemistry, Williams College, Williamstown) - Huang, Clara (RFK Science Research Institute, Glenwood Landing) - Mihailović, Dušan (Dept. of Archaeology, University of Belgrade) - Roksandic, Mirjana (Dept. of Anthropology, University of Winnipeg) - Dimitrijević, Vesna - Dragosavac, Sofija (Dept. of Archaeology, University of Belgrade) - Daković, Gligor - Singh, Impreet (RFK Science Research Institute, Glenwood Landing) - Skinner, Anne (Dept. of Chemistry, Williams College, Williamstown)

**Abstract format:** Oral

Dating ungulate teeth archaeologically associated with Middle Paleolithic (MP) assemblages enables one to obtain archaeologically significant absolute dates sites that exceed the maximum dating limit with AMS 14C. Without ESR to date cervid, bovid, and equid teeth, the archaeological and paleontological significance Pešturina, a MP site near the Sićevo Gorge and Niš, Serbia, would have been low. Pešturina's matrix-supported conglomerates yielded a Charentian Mousterian, a Denticulate Mousterian, and a blade-rich Gravettian industry in Layers 4, 3, and 2 respectively. Each layer had large mammalian faunae exploited in a mixed environment with temperate forest, rocky cliffs, and steppe within walking distances. Bone fragmentation patterns and butchering marks, plus many lithic tools demonstrate that hominins contributed most kills. In 26 ungulate teeth, > 74 enamels independently dated from the Mousterian layers had low enamel and dentinal U concentrations, ensuring that the ages were model-independent. To find volumetrically averaged sedimentary dose rates, 115 bulk sediment samples and mineralogically distinct components were measured by NAA. After early MIS 4, the erosional event that eroded parts of Layer 4a before Layer 3's deposition also reworked four teeth. The Layer 4c/4d boundary correlated to Marine (Oxygen) Isotope Stage (MIS) 5e, while Layer 4b and its Neanderthal fossils dated at 103 ± 3 ka (MIS 5c), Layer 4a and its incised cave bear axis, at 94 ± 4 ka (MIS 5b). Correlating best with Dansgaard-Oeschger (DO) Event 8, Les Cottés Interstadial, a tooth from Layer 3, the youngest Mousterian deposits, represents one of the latest Middle Paleolithic dates in the central Balkans, while the Gravettian tools in Layer 2 dated to late MIS 3, probably DO Event 6, the Denekamp Interstadial. This quasi-continuous occupation from 117 ka to 33 ka, among the longest in the central Balkans, is one of the few caves with MIS 5 deposits.

7 **VARIABILITY IN LARGE CANIDS FROM DOLNI VESTONICE II, CZECH REPUBLIC: DOMESTICATION OR PLEISTOCENE ECOMORPHS?**

**Abstract author(s):** Sazelova, Sandra (The Czech Academy of Sciences, Institute of Archeology, Brno, Centre for Paleolithic and Paleoanthropology Dolní Věstonice) - Perri, Angela (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology; Department of Archeology, Durham University) - Fewlass, Helen (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology) - Novak, Martin (The Czech Academy of Sciences, Institute of Archeology, Brno, Centre for Paleolithic and Paleoanthropology Dolní Věstonice)

**Abstract format:** Oral

Since the 19th century, attention has been focused on the canid material from Moravian Gravettian, which reveal a large variation in wolf sizes, including large, intermediate, and small forms. The observed differences exceed the standard sexual dimorphism in wolves, possibly by 20% or more (Perri and Sázlová, 2016). Observed variation have raised the question of whether dog domestication, secondary to human-driven genetic isolation, is the reason for observed morphological and dietary isotopic variation in canids (Germonpré et al., 2012; Bocherens et al., 2015). Yet, the infrequent presence of gnaw marks found at the sites, along with the absence of degenerative pathology and work-related injuries observed among working dogs (Wojtal and Wilczyński, 2015; Perri and Sázlová, 2016) suggests domesticated canids were not present here. Alternatively, it seems more likely that these remains simply represent various wolf morphotypes that developed over short time periods, as biological responses to somewhat unique ecological conditions. The research was supported with Czech Science foundation project no: 20-26094S and Czech national institutional support RVO: 68081758.

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8 **BISON AND REINDEER HUNTING IN THE UPPER PALEOLITHIC SITE OF BUDA (EASTERN ROMANIA). BEHAVIORAL AND PALAEOECOLOGICAL IMPLICATIONS**

**Abstract author(s):** Dumitrascu, Valentin (“Vasile Pârvan” Institute of Archaeology, Bucharest) - Vasile, Ștefan (University of Bucharest)

**Abstract format:** Oral

The Buda palaeolithic site was discovered in 1958 on a hilltop, in the northwest of Buda village (Bacău County), surveying the lower side of the Bistrița Valley and was excavated in two separate intervals (1958-1962 and 2012-2014). Large and numerous mammal remains appear alongside lithic elements in a 40 cm thick layer, suggesting that they belong to the same cultural event. The lithic elements present a Gravettian typology, and the absolute chronology also places the layer during this cultural unit - radiocarbon dating of charcoal and bone fragments estimated at the age of 23,810 +/- 190 years BP, (Păunescu, 1998, confirmed by Tuffreau et al., 2018). The bone and antler industry is almost absent, no consistent habitation structures have been found, traces of fire are rare and scattered, and the body parts representation of the animals is overwhelmed by elements of the distal limbs. Faunal remains - almost 2000 - were found as bone agglomerations consisting mainly of long bone extremities, complete small bones and a few jaw fragments, initially attributed to Bos/Bison and reindeer.

The morphological analysis of postcranial bovid remains, which are the most numerous, shows that they belong to the steppe bison. The assemblage is dominated by adults, mostly female, and includes few sub-adult individuals and no young juveniles.

The large number of animals suggests a communal mass killing, where small selection of individuals by sex or age is possible; therefore, we are inclined to consider that the archaeological population reflects to a reasonable extent the living population from which it was extracted. Due to the age and sexual structure of the bison and reindeer population, we estimate that the hunting event took place at the beginning of the cold season.

9 **FRAGMENTATION IN THE CONTEXT OF TAPHONOMICAL ANALYSIS OF FAUNAL REMAINS FROM THE MID-UPPER PALEOLITHIC SITE PAVLOV I (SETTLEMENT UNIT S1)**

**Abstract author(s):** Boriová, Sona - Sázelová, Sandra - Šálievá, Soňa - Novák, Martin (The Czech Academy of Sciences, Institute of Archeology, Brno, Centre for Paleolithic and Paleoanthropology Dolní Věstonice)

**Abstract format:** Oral

The Pavlov I site was excavated by two researchers, B. Klíma in 1950s-1970s and J. Svoboda in 2013-2015 (Klíma, 1954; Svoboda et al., 2016). During the newest season areas previously studied and newly explored were uncovered. In the freshly uncovered south-east area the new settlement units accompanied by concentrations of bones and lithic artefacts were identified. The unit S1 is characterized as shallow circular depression ca 5-6 m in diameter, filled with anthropogenic sediments, with two recognized micro-phases. The osteological material dispersed around this unit consists of different animal species such as woolly mammoth (*Mammuthus primigenius*), reindeer (*Rangifer tarandus*) and various species of carnivores (Svoboda et al., 2016a). This contribution aims on the presentation of the detailed taphonomic analysis of faunal remains, namely differences between human and non-human depositional and post-depositional fragmentation traces, displayed at this settlement unit and in the comparison with previously published studies concerning Pavlov I site, for example by Musil (2005). The research was supported with the Czech Science Foundation project no: 20-26094S “Hunters at a camp: Reconstruction of spatial behavior at Moravian Gravettian sites” and the Czech national institutional support RVO: 68081758 - The Czech Academy of Sciences, Institute of Archeology, Brno.

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10 **SHIFTING ENVIRONMENTS, ANIMAL ECOLOGIES AND SUBSISTENCE STRATEGIES DURING THE LAST GLACIAL MAXIMUM AND BEYOND AT LAS CALDAS CAVE (NORTHERN SPAIN)**

**Abstract author(s):** Jones, Jennifer - Marín-Arroyo, Ana (Grupo EVOADAPTA. Instituto Internacional de Investigaciones Prehistóricas. Universidad de Cantabria) - Corchón, María Soledad (Universidad Departamento de Prehistoria, Historia Antigua y Arqueología, Universidad de Salamanca) - Richards, Michael (Department of Archaeology, Simon Fraser University)

**Abstract format:** Oral

During the Last Glacial Maximum-LGM (23-19kyr cal. BP), the Cantabrian Region in Northern Spain acted as a refugium for animals and humans, when central and northern Europe suffered during periods of extreme cold. Reconstructing what conditions were like and how humans and animals adapted to changing environments is fundamental for understanding human resilience. The site of Las Caldas was consistently occupied during and after the LGM, with a rich archaeological record of lithics, hearths, osseous industry and portable art. The abundant and well-preserved macromammal remains provide an ideal opportunity to reconstruct local envi-

ronmental conditions, and how humans adapted their subsistence strategies in response. This paper uses bone collagen isotopic analysis, alongside zooarchaeological and taphonomic results to explore the relationship between changing environments, shifting animal ecologies and hunting strategies both, during and after the Last Glacial Maximum.

Cold and wet conditions are recorded isotopically during the Solutrean (23-19 kyr cal. BP), before an improvement in the Magdalenian (16-14.5kyr cal. BP). This coincides with a shift in the secondary hunted prey from horse to ibex. During the Magdalenian, the ibex inhabited their preferred niche of higher altitudes, allowing them to thrive and the montane zone becomes an important hunting location. Higher species diversity, also seen in the Magdalenian, suggests widening of hunting areas into previously under exploited zones, facilitated by new technologies that appear in the archaeological record at this time and likely motivated by a demographic increase, requiring larger catchment areas.

At Las Caldas, during the Late Pleistocene, humans and animals were able to tailor their behaviour in response to changing conditions, allowing them to survive. Mosaic environments and range of biotopes available in the Cantabrian Region were key to human and animal survival during this time, as seen from human and animal genetic evidence.

11 **ANIMAL EXPLOITATION DURING THE LAST GLACIAL MAXIMUM IN THE WESTERN CANTABRIAN REGION: INSIGHTS FROM THE NALÓN VALLEY (NORTHERN IBERIA)**

**Abstract author(s):** Torres-Iglesias, Leire - Marín-Arroyo, Ana B. (Grupo EVOADAPTA. Instituto Internacional de Investigaciones Prehistóricas de Cantabria. Universidad de Cantabrian) - de la Rasilla, Marco (Área de Prehistoria, Universidad de Oviedo)

**Abstract format:** Oral

During the Last Glacial Maximum, the harsh environmental conditions produced the withdrawing of human populations from northern Europe to the southern part of the continent. As it is shown by the genetic, paleoenvironmental and subsistence studies carried out to date, the Cantabrian Region, in northern Iberia, played an important role as a refugium for the human populations and natural ecosystems during this period. This, in addition with the high density of Palaeolithic sites located in this region, make it a relevant area to analyse the human-environment interactions and to assess how the human groups adapted to those climatic changes.

The Nalón Valley, in the western part of the Cantabrian Region, concentrates important caves and rock shelters with Palaeolithic deposits and rock art, mainly dating to the Upper Palaeolithic. A review of the current research state about the subsistence strategies and the paleoecological information of the available Solutrean sites (Las Caldas, La Lluera and La Peña de Candamo caves) is presented here. The preliminary results of our zooarchaeological and taphonomic analysis of the macromammal remains found on the Solutrean levels of La Viña Rock Shelter, located in the same Nalón Valley, are also presented and compared with the palaeoeconomic information of the surrounding sites.

All the gathered information will allow to decide which research line must be explored further for providing a better understanding of the human behaviour in relation with the ecological conditions during the Last Glacial Maximum.

This research is funded by the University of Cantabria and the Government of Cantabria (predoctoral research fellowship), the ERCEA (ERC Consolidator Grant-818299) and the Spanish Ministry of Science, Innovation and Universities (PGC2018-100010-B-I00).

12 **DATA ON THE MAMMUTHUS PRIMIGENIUS SEASONAL MIGRATIONS IN THE KHOTYLEVO-2 SITE VICINITY (BRYANSK OBLAST, RUSSIA)**

**Abstract author(s):** Maschenko, Evgeny (Boryssiak Paleontological Institute Russian Academy of Science) - Voskresenskaya, Ekaterina (Institute of Geography Russian Academy of Science) - Gavrilov, Konstantin (Institute of Archeology Russian Academy of Sciences)

**Abstract format:** Oral

The first evidence of *M. primigenius* seasonal migrations was obtained based on the synthesis of data of Late Pleistocene paleogeomorphology of the Desna River valley and the mammoths remains on the Khotylevo 2 site (24960±400-19 600±450 BP). The system of flat-bottom and through valleys (Gosoma River) near the site was way for the mammoth's group migrations of this region along the meridional passage between Desna and Sudost river systems. In addition, this route could be related to visits by mammoths to the scree of weathered chalk and marl as the mineral nutrition at the slopes bedding of the Desna valley. Modern elephants and close to them in the biology *M. primigenius* need permanent mineral nutrition and its presence is the significant factor what determines their distribution. In addition, near the slopes bottom the Desna right bank located a dozen springs, which was essential for the mammoths survival during winter. Thus, the Khotylevo 2 site is located to that part of the valley along which seasonal migration of mammoths took place for hundreds of years. With natural mortality, “mammoth cemeteries” could have formed here and the mammoths themselves were an affordable hunting object. On the site mammoths remains consist 97-98% of the total number of bones. The amount of individuals, defined over last 10 years of excavation, exceeds 25. The other mammals remains are sporadic. The age profile of *M. primigenius* shows the presence of all age groups (both males and females), excluding calves (2 individuals). An analysis of the spatial organization of the mammoth bone concentration at the Khotylevo 2 site allows us to interpret their as structural elements of a specific complex that formed in several stages and, apparently, had a sacral character for its creators.

The studies were supported by RFBR projects no.18-09-00688 and 18-00-00542.



MEGAMAMMALS LANDSCAPES DURING FIRST SOUTH AMERICAN PEOPLING (LATE PLEISTOCENE- EARLY HOLOCENE, ARGENTINA)

**Abstract author(s):** Lanata, Jose (CONICET) - Chichkoyan, Karina (CONICET-ILDyPCa) - Suárez, Gabriel (Universidad de Morón) - Tessone, Augusto (INGEIS-CONICET) - Moschen, Nadia (ILDyPCa-CONICET) - Briones, Claudia (CONICET-UNRN) - Lanzelotti, Sonia (IDECU-CONICET)

**Abstract format:** Oral

Environmental conditions show evidence of extreme changes during the Late Pleistocene-Early Holocene (circa 20.000 to 8.200 cal BP) in South American. During this period two important biotic events took part: human dispersal and extinction of megafauna. The debates have mainly focused on the drivers behind this megafunal extinction event (humans vs. climate). Along with the arrival of humans, mammals’ reorganizations coincided with fast climatic oscillations that resulted in habitats becoming more fragmented. However, it is not clear yet to what extent megamammal communities reacted to these climate oscillations and how Homo sapiens were involved in this changing paleoecological dynamic.

Disentangling this process, on an archaeological scale, can be undertaken in the Pampean and

Patagonian regions (located in the southern tip of this continent), given the co-occurrence of Late Pleistocene-Early Holocene human evidence and rich megafaunal communities. This research explores novel paleoecological approaches towards gathering non-traditional information about megafaunal extinctions.

Three lines of evidence are being currently developed considering fossil assemblages from Luján (Pampas) and Bariloche (Patagonia).

Paleopathologies: Species illness, quality of life and interactions amongst each other are being studied though the identification of different paleopathologies. Information is being recollected especially in Luján location, given the extensive record present there.

Isotopes (δ13C and δ15N): Ecology of the non-analogous species assemblages that inhabited these locations is being explored through isotopes. High resolution methods (e.g. ultrafiltration) are being currently tested in order to perform these analyses.

Modelling: Mathematical and distributional models were developed for understanding extinction processes, human dispersion and megamammal distributions. Proxies are being gathered in order to create models, and to compare datasets.

PLEISTOHERD: LINKING INTRA-TOOTH STRONTIUM ISOTOPE PROFILES AND ISOSCAPES USING COMPUTATIONAL MODELLING TO RECONSTRUCT PALAEOMIGRATIONS

**Abstract author(s):** Britton, Kate (University of Aberdeen; Max Planck Insitute for Evolutionary Anthropology) - Le Corre, Mael - Wright, Josh (University of Aberdeen) - Côté, Steeve (Université Laval, Montreal) - Grimes, Vaughan (Memorial University, Newfoundland)

**Abstract format:** Oral

Our ability to reconstruct ranging behaviours and seasonal movements of Late Pleistocene faunas has greatly improved with the development of isotope techniques (e.g. 87Sr/86Sr) that target incrementally developed tissues preserved in the archaeological and palaeontological record, such as tooth enamel. However, in order to reconstruct past migratory routes across landscapes (‘palaeomigratory corridors’), more nuanced approaches to both data generation and data analysis are required. Here, focusing on reindeer/ caribou as a case study, we present the methodological framework for an isoscape-based model which will assess the distribution and migratory movements of fauna from their intra-tooth isotope data, the PleistoHERD model. Our model integrates intra-tooth and landscape isotope data using GIS analysis and movement modelling methods from modern ecology. In developing the model, we use intra-tooth isotope profiles from modern migratory caribou from the Rivière-aux-Feuilles herd, Québec, Canada, alongside creating a working 87Sr/86Sr isoscape. Strontium isotope data were generated using both micro-sampling/solution methods and laser ablation approaches. A Bayesian spatial assignment approach is used to identify the ‘origin’ of intra-tooth samples from each individual and produce a time-series probability distribution map for each caribou. Caribou movements were then modelled throughout the time-series distribution map to identify potential winter and summer ranges and migration routes, refined using habitat suitability models. The comparison of reconstructed seasonal movements with real migratory movements, assessed from 30 years of telemetric survey of the Rivière-aux-Feuilles herd, allow us to validate the model. The implications of the PleistoHERD model for the reconstruction of Rangifer movements in Late Pleistocene France, and for the use of strontium isotope analysis in archaeology more broadly, will be explored.

a.

HISTOLOGY OF THE DENTAL HARD TISSUES OF CANIS LUPUS FROM MID-UPPER PALEOLITHIC MORAVIAN SITES

**Abstract author(s):** Šáľiová, Sona - Sázelová, Sandra - Boriová, Soňa (The Czech Academy of Sciences, Institute of Archeology, Brno, Centre for Paleolithic and Paleoanthropology Dolní Věstonice)

**Abstract format:** Poster

The dental enamel contains regular growth increments occurring as periodically repeating intervals. Short-period structures are formed within 24-hour periodicity, long-period are formed within longer periodicity of several days. In order to study the individual’s life history, the microstructure of the dental hard tissues can provide a record of survived individual and environmental stress

events such as malnutrition, weaning or seasonal changes of resource availability (eg. Hogg 2018, Kierdorf 2019).

The contribution deals with preparation and microscopic analysis of dental thin-sections of three 4th upper premolars from three different adult wolves from the Mid-Upper Paleolithic microregion Dolní Věstonice - Pavlov - Milovice.

The contribution aims on the presentation of the methodological procedures applied in the production of non-decalcified histological thin-sections of dental hard tissues from Paleolithic samples. The contribution presents the hidden risks of preparation of the thin-sections, detailed description of the microscopic record of these sections and data analysis, together with documentation of the individual microscopic record. Finally, the taphonomic changes affecting dental tissues and results of microscopic analysis will be discussed. The research was supported with the Czech Science Foundation project no: 20-26094S “Hunters at a camp: Reconstruction of spatial behavior at Moravian Gravettian sites” and the Czech national institutional support RVO: 68081758 - The Czech Academy of Sciences, Institute of Archaeology, Brno.

Hogg, R., 2018. Permanent Record: The Use of Dental and Bone Microstructure to Assess Life History Evolution and Ecology: Reconstructing Cenozoic Terrestrial Environments and Ecological Communities, in: Vertebrate Paleobiology and Paleoanthropology. pp. 75–98.

Kierdorf, H., Breuer, F., Witzel, C., Kierdorf, U., 2019. Pig enamel revisited – Incremental markings in enamel of wild boars and domestic pigs. J. Struct. Biol. 205, 48–59.

b.

ESR DATING AT MATUZKA CAVE, NORTHERN CAUCASUS MT., RUSSIA: IMPLICATIONS FOR ITS PALEOLITHIC ARTEFACTS, NEANDERTHAL TEETH, AND PALEOMAGNETIC EXCURSION.”

**Abstract author(s):** Blackwell, Bonnie (RFK Science Research Institute; Dept of Chemistry, Williams College, Williamstown) - Golovanova, Liubov - Doronichev, Vladimir (Laboratory of Prehistory, St. Petersburg) - Skinner, Anne (Dept of Chemistry, Williams College, Williamstown) - Blickstein, Joel - Baboumian, Shauntè - Ortega, Amy (RFK Science Research Institute, Glenwood Landing)

**Abstract format:** Poster

Without reliable and accurate chronometric dates, trying to correlate the Paleolithic assemblages and zooarchaeological data between sites or with global climatic records (Marine Isotope Stages, MIS) becomes a futile exercise, as occurred at Matuzka Cave, Russia: Two incorrect dates had correlated its Neanderthal incisors, early Middle Paleolithic (MP) assemblages, detailed zooarchaeological fossils, and paleomagnetic excursion with MIS 5-4. Instead, its deposits span MIS 7a-5d. Rather using than just one layer, 12 mammalian teeth were dated with ESR for eight horizons. Geochemically analyzing 39 sedimentary components measured volumetrically averaged sedimentary dose rates were calculated. At 211 ± 13 ka (MIS 7a), an archaic lithic assemblage was deposited during the Pringle Falls Paleomagnetic Excursion. The oldest known from the Caucasus, Homo neanderthalensis incisors were associated with Leaf Point and bifacial tools. Layers 6 and 5b dated at 195 ± 9 ka and 192 ± 16 ka (MIS 7a) respectively. In Layers 5A-4D, Neanderthals kept leaving Mousterian tools periodically until 191 ± 29 ka (MIS 7a). Thereafter, erosion removed sediment over ≤ 24 ky, likely during MIS 6f, the coldest time in MIS 6. From 168 ± 19 ka (Layer 4C) to 133 ± 11 ka (Layer 4A), when sedimentation probably averaged 3 + 3 cm/ky, Neanderthals using Micoquian industries like those in northwestern Caucasus (Layer 4B) and Levalloiso-Mousterian industries like those in southwestern Caucasus (Layer 4A) occasionally visited the cave during late MIS 6. Under high humidity, another erosive event removed sediment deposited during MIS 5e (133-112 ka). From 112 ± 12 ka to 110 ± 11 ka (MIS 5d) when rapid sedimentation averaged up to 24 ky/cm, Neanderthals left Levalloiso-Mousterian assemblages in Layers 3B-3A. Then, another erosive event(s) removed all the deposits dating to ~ 110-11 ka. Thereafter, Layers 1-2 saw modern humans leave Énéolithic to Medieval artefacts (MIS 1).

c.

SEDIMENTARY RADIOACTIVITY IN AN UPPER PALEOLITHIC-MIDDLE PALEOLITHIC (MP-UP) TRANSITION SITE: INCREASING ESR TOOTH DATING ACCURACY AT GOLEMA PEŠT, NORTH MACEDONIA

**Abstract author(s):** Blickstein, Joel (RFK Science Research Institute) - Blackwell, Bonnie (RFK Science Research Institute; Dept. of Chemistry, Williams College, Williamstown) - Šalamanov-Korobar, Ljiljana (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - Kitanovski, Blagoja (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - Spirova, Marina (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - Huang, Clara - Zhuo, Jialin - Singh, Impreet (RFK Science Research Institute, Glenwood Landing)

**Abstract format:** Poster

Dating ungulate teeth archaeologically associated with Paleolithic assemblages has produced archaeologically significant absolute dates and sedimentary data for Golema Pešt, North Macedonia, to identify significant paleoenvironmental conditions in the Upper (UP) and Middle Paleolithic (MP) layers, and compare them with regional paleoenvironmental sequences. ESR (electron spin resonance) dates require accurate sedimentary dose rates, especially in caves where internal and cosmic dose rates approach 0. Reaching >5.5 m deep, >21 flatly lying, silty-sandy matrix-supported gravel layers with éboulis clasts fill the cave. In Sondage 2, Layers 0-5 contained many hearths associated with thousands of vertebrate fossils, many from ungulates. In Layers 2-5a sat thousands of lithics, many made on tiny quartz crystals. Layers 5b-6 yielded Mousterian assemblages with denticulates, notched tools, Levallois cores and flakes. In Sondage 5, the MP-UP transition occurred at Layer 1-2, where a thin UP horizon overlay a thin sterile zone, under which lay MP horizons with Levallois flakes and Mousterian tools. To measure the volumetrically averaged sedimentary dose rates for ungulate teeth dated by ESR from Sondage 2, >65 sediment samples measured for U, Th, and K. Adding éboulis, calcined bone, and charcoal associated with the hearths lowered the sedimentary dose rates or left them unchanged. In Layer 2, 198 cm below



datum, the Campanian Ignimbrite (CI) cryptotephra caused abnormally high sedimentary U, Th, and K concentrations and dose rates. Dated at 42 ka, the CI lay > 15 cm below the MP-UP transition. Another 28-30 cm below the CI lay AT77, a cervid tooth dating >80 ka (early Marine Isotope Stage 4, when climates grew much colder). Analyzing sedimentary compositions at every 2 cm in Layers 0-3 yielded a highly detailed stratigraphy that reduced uncertainty in the sedimentary dose rates and ESR ages, but more detailed sedimentary analyses must be completed in the deeper layers.

67

## GENS NORMANNORUM – UNDERSTANDING NORMAN INTERACTIONS THROUGH MATERIAL CULTURE

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Lewis, Michael (British Museum) - Molinari, Alessandra (Università degli Studi di Roma ‘Tor Vergata’) - Skiba, Viola (Reiss-Engelhorn-Museen)

**Format:** Regular session

‘Norse-men’ in origin, the Normans are well known for their interactions abroad (outside France), conquering England, Sicily and parts of Italy, establishing themselves elsewhere also. Their material culture is likewise well known for being diverse, seemingly embracing - even assimilating - with that of those whom they came into contact with. Consequently, through their various networks and routes of communication, ‘Norman’ material culture in England, for example, is quite different to that of the ‘Normans’ whom settled in Italy or Sicily. So, to what extent can a gens normannorum be observed through the archaeology and material culture of the Normans across the places where they lived?

We invite people to consider Norman interactions through archaeology and material culture in its widest sense, from the relationship of the objects they used, and the place of these in sites or the landscape, to those of the cultures around them, to whether or not it is possible to associate material culture with the Normans specifically. This session is being proposed as part of thinking towards exhibitions on the Normans at Reiss-Engelhorn Museum (Mannheim) and the British Museum (London), and therefore it is hoped will bring to light new thoughts and ideas that can help interpret objects that might be presented for public display.

## ABSTRACTS

1

### UNDERSTANDING AND PRESENTING THE NORMANS: NORMAN IDENTITY AND THEIR MATERIAL CULTURE IN A HISTORICAL PERSPECTIVE

**Abstract author(s):** Skiba, Viola (Reiss-Engelhorn-Museen Mannheim)

**Abstract format:** Oral

Approaching the term “Normans” and trying to define the group of people behind it, we are confronted with different associations and concepts, which vary considerably. There are different views between different countries or regions which are connected to their past and present identity. In Medieval Europe the Normans seem to have been everywhere – with an exception, maybe, to the Holy Roman Empire –, and left behind material culture and historiographic evidences. A very interesting question is, how these did relate to each other. Was there a common identity, an idea what being a Norman meant? Where they really a well-defined group which we can identify either by their self-perception or by the material they left behind? How were the Normans in different regions connected and what did they bring with them or exchange?

The proposed paper will outline some information about the use of the term ‘Norman’ and the construction of a Norman identity by the Normans themselves, but also by the people they came in contact with. These historiographic sources will be confronted with material evidences and problems with what they tell us about the “gens Normannorum”. Moreover, some issues will be touched, which relate to the challenge to create an exhibition on such a changeable people like the Normans.

2

### PRESENTING NORMAN MATERIAL CULTURE: OPPORTUNITIES AND CHALLENGES (A BRITISH PERSPECTIVE)

**Abstract author(s):** Lewis, Michael (British Museum; Portable Antiquities Scheme)

**Abstract format:** Oral

The potential loan of the Bayeux Tapestry to the United Kingdom in 2024 (agreed in principle between the French and British governments in 2018) provides an exciting opportunity to highlight other aspects of Norman material culture to a British audience. But perhaps that is easier said than done! Although the historic landscape across Britain is marked with ‘so-called’ Norman castles, cathedrals and churches, and the impact of the Normans is evident in surviving written sources (including the Domesday Book and charters), as well as manuscript illuminations, other aspects of ‘the Norman achievement’ are less obvious. Indeed, there is a general dearth in the material culture of the 11th century, unlike in the centuries immediately before and after, and this is apparent elsewhere in Europe also, including in the Norman homelands and other places they interacted with. More than that, it is not certain what survives in Britain is actually Norman, so influenced were the Normans by the cultures of others. The Romanesque, for example, which in England is specifically associated with the Norman Conquest of 1066, is not typically regarded as Norman elsewhere. This paper will therefore explore some of these issues, and ask, if we cannot absolutely determine what is Norman material culture, how do we tell a story of the Normans through objects?

3

## FROM ISLAMIC TO NORMAN SICILY. MATERIAL CULTURE, FOOD HABIT AND SETTLEMENT SYSTEM

**Abstract author(s):** Molinari, Alessandra (University of Rome Tor Vergata) - Carver, Martin (University of York) - Aniceti, Veronica - Colangeli, Francesca (University of Rome Tor Vergata) - Fiorentino, Girolamo (University of Salento) - Meo, Antonino - Orecchioni, Paola (University of Rome Tor Vergata) - Primavera, Milena (University of Salento)

**Abstract format:** Oral

One of the main aims of the ERC project ‘Sicily in Transition’ (ERC AG 693600 SicTransit) is the study of the Norman period, a crucial one in the history of Sicily. Our approach applies an integrated study to changes in material culture, sustenance (especially plants and herd animals) and settlement form over the period 6th to mid 13th century.

The new picture that is emerging for the Norman Period (mid 11th to the end of 12th century) is as complex as ever, and includes significant aspects of both innovation and persistence. For example, while ceramic production shows some continuity, it serves new exchange networks both within and outside the island. In food production and consumption, farming techniques and plants introduced in the Islamic period still feature in town and country, but there are important changes in types of diet formerly proscribed by religious custom, for example in the eating of pork. Meanwhile in the settlements, the emergence of prestigious buildings of a completely new type is particularly noteworthy, signalling changes in hierarchy both in the settlements and in society.

4

### THE NORMANS IN APULIA, APULIAN NORMANS. FROM CONQUEST TO SETTLEMENT: THE CAPITANATA AREA AND THE MONTECORVINO CASE STUDY

**Abstract author(s):** d’Altília, Luca - Favia, Pasquale - Giuliani, Roberta - Cardone, Angelo - Surdo, Anna (University of Foggia)

**Abstract format:** Oral

Southern Italy is notoriously one of the Normans’ main settlement areas, among their movings across Europe.

In this process they encountered different settlement patterns and a well structured knowledge in construction and production techniques, nevertheless they brought in their own peculiarities. The “Northern Knights” did use their knowledge in defensive earth and stone works and craftsmanship.

Different examples of this process, regarding Apulia, will be presented in this paper, with a particular focus on the Montecorvino case study, especially about building techniques.

The medieval town of Montecorvino, in the North Apulian region, called Capitanata, founded by the Byzantine empire in the first decades of the 11th Century, was fortified once conquered by the Normans. On the western end of the settlement, an artificial earth mound (“motte”), surrounded by a defensive ditch and topped by a stone tower, was raised.

Local craftsmen worked on the castle’s construction, guided by foreign masters specialised in military architecture and masonry techniques. The use of a hot lime mortar (which originated in medieval Northern Europe) could well be a clue for guessing their area of origin.

Some foreign workers have also been employed in the construction of the Cathedral. At the time of Bishop Albert (who was of Norman origin), the church was restored with a typical “northern” plant (three naves and two small towers on the front, as it is in many Norman churches in Southern Italy). Some stones with “chevrons” surface finish (a well documented technique in Norman religious buildings) were also set in place in the new restored church. Masonry analysis shows that the foreign masters mainly worked on the construction of the two front towers, while local craftsmen worked on the church side walls, sometimes imitating skilled workers’ techniques.

5

### TOPOGRAPHY AND LANDSCAPE IN THE NORMAN COUNTY OF CALABRIA.

**Abstract author(s):** La Serra, Cristiana - Lico, Fabio (Freelancer)

**Abstract format:** Oral

The Norman knights in Calabria, among the various innovations, introduced the element “castle” in the new organization of the already existing settlements in the area. It is a substantial modification of the territory compared to the previous Byzantine domination.

Taking as a sample area a strip of central and southern Calabria, we will analyze the transformations that the habitat and the landscape have undergone following this innovation. Everything revolves around the first capital of the County of Calabria, Mileto, where the Grand Count Roger decided to live with his family. This ancient town was in origin a byzantine settlement, and it was destroyed in the 1783 by an earthquake. At the present it is a desert village, but it still retains the vestiges of the early Norman age.

Starting from here we will analyze the topographical relationships between the new typology of the castle and the pre-existing urban system of Byzantine origin, in connection with the evolution of wall-systems, and the network created with the countryside.

72      **ARCHAEOLOGY AND INTERDISCIPLINARITY: THE NEW STATUS QUO OR THE NEW BUZZWORD?**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Ribeiro, Artur (University of Kiel / Christian-Albrechts-Universität zu Kiel) - Ion, Alexandra (Institute of Anthropology Francisc I.Rainer)

**Format:** Regular session

The recent introduction and development of new scientific techniques in archaeology has led to several original insights concerning the lives of past human populations, from migratory patterns and diseases in aDNA research, land-use patterns and climate data on a global scale, to the impact of the new geological era known as the Anthropocene. This new form of research is based on composite teams, with researchers of varied disciplinary backgrounds, such as chemistry, physics, climatology, history, anthropology, to name only a few. Everywhere we turn, archaeologists from around the world seem to be embracing interdisciplinary research as the new paradigmatic way of conducting projects, and funding agencies make it a cornerstone criterion

However, despite the popularity of claims of interdisciplinarity there seems to be no consensus in archaeology as to what interdisciplinary “knowledge” actually is. As stated by the eminent sociologist Immanuel Wallerstein, disciplinary boundaries have always been arbitrary, nothing more than historical products that reflect poorly the actual concerns and problems that affect the world in the 21st century. Or in other words, ‘interdisciplinarity has no inherent meaning’ to quote Julie Thomson Klein.

For this reason, we find timely a critical discussion that engages with the epistemological and practical issues raised by this omnipresent concept. Is interdisciplinarity producing an actual new form of knowledge or is it the collapsing of artificial boundaries that should have never existed in the first place? Is it even possible to attain this aspiration, given how current disciplines, journals or institutions are structured? and finally, in light of interdisciplinarity, does it still make sense to recognize in archaeology a differentiation of human and natural sciences? The aim of this session is to critically assess interdisciplinarity as a concept in archaeology and to engage with prime examples of interdisciplinary research of recent years.

**ABSTRACTS**

1      **WHAT DO WE MEAN WHEN WE THINK OF “INTERDISCIPLINARITY”? CHALLENGES AND ALTERNATE THEORETICAL MODELS - MICROHISTORY AND OSTEOBIOGRAPHY**

**Abstract author(s):** Ion, Alexandra (Institute of Anthropology Francisc I. Rainer)

**Abstract format:** Oral

From funding bodies, to conference panels and news outlets we hear about research which should be interdisciplinary. But what do we mean by this term, and what do we expect from interdisciplinary research to do for us? ‘Interdisciplinarity, in short, has no inherent meaning’ as Julie Klein (2005, 63) rightly points out. From Ancient times to postmodern research, the search for a unified knowledge of phenomena went through various definitions. It is a history marked not only by the tension and inter-connected relation between specialised knowledge, and the search for a generalist model, but also one which slowly saw the emergence of a divide between humanities and science. However, I think that focusing on this divide can be misleading from some point onward, and instead the question should be: how can we bring multiple kinds of data together to tell a coherent story? In my talk I will focus on the challenges that we face when trying to find an easy answer, but also on several available theoretical models that could get us there. Regarding potential challenges, if we are to understand interdisciplinarity in archaeology we need to evaluate the tension between the particular nature of the record and the broad goal of archaeology, the conflict between top-down and bottom-up theorizing, this bringing with it a whole set of oppositions between empirical and interpretative focus/ deductive and inductive reasoning. In respect to potential solutions, microhistory and osteobiography are two interesting models that have lessons to offer us.

References:

- Klein, J. T. 2005. Humanities, Culture, And Interdisciplinarity: The Changing American Academy. New York: State University of New York Press.

2      **THREE FACETS OF INTERDISCIPLINARITY: POWER, POLITICS AND PROFIT**

**Abstract author(s):** Henty, Ann (University of Wales Trinity Saint David; Journal of Skyscape Archaeology)

**Abstract format:** Oral

In the 1970s and 80s social theorists like Kuhn, Bourdieu and Geertz analysed the components of academic disciplines and found that disciplines needed to have the following three characteristics to ensure their separate existence: theory and methodology, language and community. It was the recognisable differences in these components that not only separated one discipline from another but kept them apart. Yet Dearborn suggested this artificial partitioning of knowledge into disciplines affected our perceptions and limited our actions. Archaeology in the 1960s experienced disciplinary innocence, recognised by Clark in 1973, before processualism drove the formation of many associated subdisciplines which relied on specialised knowledge brought from other scientific disciplines. However, Dogan suggested that the division of disciplines into specialised subfields has led to hybrid specialisms, where the point of contact is between sectors rather than through disciplinary boundaries. Almost imperceptibly this evolution has led to interdisciplinary collaboration which involves bringing together autonomous disciplines to create new models that would not be possible if the disciplines worked separately, according to Resnick. The result should be that single discipline knowledge is transformed to become more far-reaching than before. While this might be epistemologically advantageous for archaeology and bring irresistible kudos, there is another political trend which may make this transition inevitable. This is the increasing politicisation of university education in general and the rise of managerialism within institutions. For example archaeology is arbitrarily placed as a subset of the Institute of Education and Humanities at The University of Wales Trinity Saint David yet is in the school of geosciences at the University of Aberdeen. Another driving motive is funding where it may be possible to attract a higher level of funding for a ‘science’ project, than one stemming from the humanities. These issues should form part of the debate about interdisciplinarity.

3      **THE LOSS OF SCIENTIFIC AUTARCHY AND THE NEW FRONTIERS OF CRITICAL KNOWLEDGE: CAVEATS AND BENEFITS IN MOBILITY STUDIES**

**Abstract author(s):** Cavazzuti, Claudio (University of Bologna; Museo delle Civiltà. Rome; Durham University)

**Abstract format:** Oral

The recent isotopic investigations carried out in Northern Italy and focussed on the mobility of Bronze Age communities have required the contribution of different disciplines besides archeology: namely biogeochemistry, physical anthropology, sedimentology, geomorphology.

In the various phases of the research, different fields of expertise were involved and stimulated to sacrifice the impulse towards epistemological and methodological autarchy. A series of tests and measurements have been conducted in order to refine the different methods, in the attempt to make them more applicable to the analysis of prehistoric contexts. I will therefore highlight the benefits of a flexible, conscious, self-critical approach in three specific phases of the investigation process, namely a) the sampling strategy; 2) the construction of the isotopic landscape (or ‘isoscape’) to be used as reference for local 87Sr/86Sr signatures; 3) the interpretation of the results. I will then discuss the importance of genetics and the advantages of applying aDNA analysis to the contexts, which provide the most complete set of archaeological, osteological and biogeochemical evidences.

4      **MULTI-, CROSS-, INTER-, TRANS-DISCIPLINARITY IN ARCHAEOLOGY – FACT OR FICTION? DOES ARCHAEOLOGY NEED A ROD MIXER?**

**Abstract author(s):** Lindstrom, Torill Christine (Department of Psychosocial Science, Faculty of Psychology, University of Bergen; SapienCE, Centre for Early Sapiens Behaviour, CoE, Faculty of Humanities, University of Bergen) - Zubrow, Ezra (Dept. of Anthropology, University of Buffalo; Dept. of Anthropology, University of Toronto)

**Abstract format:** Oral

Among the EAA-2020 presentations, there is a substantial number with one of the terms: multi-disciplinary, cross-disciplinary, interdisciplinary, or trans-disciplinary. Clearly new buzz-words.

Archaeology has a long and strong reputation of multi-, cross-, inter-, and trans-disciplinarity. Unfortunately, these terms are often erroneously used interchangeably.

We will explore the following: Is archaeology’s interdisciplinarity unique? Is there a relationship between diminishing generality and increasing interdisciplinarity? And finally, how well do inter-&trans-disciplinary aspirations and ideals function in reality within archaeology? Are the boundaries between humanities and hard-sciences really transcended?

Some examples from archaeological praxis: Successful: Combination of parasitology and classical literature-studies shed new light on Roman baths. Odontology explained differences in Neanderthal behaviours, findings that relate to gender-studies. Unsuccessful: A thesis about topics from classical archaeology was rejected because it was trans-disciplinary and not “classical” enough, and psychological elements outright rejected. A research-centre titled Centre of Excellence because of its excellent multi-scientific approaches struggles to integrate the information into an inter-connected archaeological story.

Conclusion: Modern archaeology cannot “stand alone on its own feet”. It is deeply dependent on other fields’ theories, research, and collaborations. However, these problems often emerge: The voices of “the other” fields are so strong that they overrule and minimize the importance of archaeological knowledge and arguments (e.g. DNA in migration-research). Or the opposite: Important voices from other fields are poorly understood, and thus ignored or rejected. Finally, perhaps the most obvious problem: Information collected from perspectives of other fields appears hard to integrate and mix with archaeology, leading to findings being presented as “separate dishes” instead of as “a salad”, or (even better): as “a stew”. – What archaeology needs to become truly inter- and trans-disciplinary is a theoretical and methodological rod mixer.

5      **MAKE ACADEMIA [GREAT AGAIN!] BETTER! AN ENVIRONMENTAL ARCHAEOLOGIST’S CASE FOR TRANSDISCIPLINARY AND INCLUSIVE RESEARCH**

**Abstract author(s):** Forbes, Veronique (Memorial University)

**Abstract format:** Oral

This paper builds on a cross-disciplinary review of recent theoretical developments to call for the active and deliberate dismantling of artificial boundaries between Sciences and the Humanities and the democratization of knowledge. To achieve impactful global change research that is relevant and ethical, it is not enough to work within international, cross-disciplinary research networks. Researchers should involve local stakeholders in project design and execution, disseminate the results and implications of their

research in ways that are accessible, engaging and meaningful, and lead (and mentor) by example; otherwise they risk reproducing the structural inequalities inherent in the academy. By identifying key areas for improvement in the practice of environmental archaeology and suggesting ways to address perceived shortcomings, I will attempt to establish a responsible research program focusing on human-environmental interactions on the island of Newfoundland in Canada. I will do this by presenting a pilot project aiming to examine the legacies of cultural and ecological interactions at the UNESCO World Heritage Site of L'Anse aux Meadows to be critically appraised by the audience.

6

### INTERDISCIPLINARITY. I CAN'T BELIEVE IT'S NOT BETTER!

**Abstract author(s):** Nilsson Stutz, Liv (Linnaeus University)

**Abstract format:** Oral

Archaeology has a long history with interdisciplinarity. Through collaborations across the board, archaeology has been a frequent borrower of theories and methods from other disciplines, and the development of these relationships can be read as a history of the trends shaping the field throughout the 20th and 21st centuries. It can be said that archaeology, to a large extent has become defined by its partners, not by its own core.

In recent years, archaeology has rekindled its relationship with the natural sciences, following a general trend of a desire for hard facts, abandoning the Humanities said to be "in crisis" (as a backlash against postmodernism) and also following the reward system of the Academy where the natural sciences offer better grant prospects and heavier impact factors. This kind of interdisciplinarity is, without a doubt, valuable, but it also has its limitations, in particular in how it affects the research process and the research questions by narrowing them down to fit the natural science model. Another problem with the dominating interdisciplinary models in archaeology is that they are limited to a dyadic relationship which misses out on the possibilities of really engaging with a broad range of disciplinary perspectives.

This paper takes a critical look at the mechanics of these relationships and how they affect the field of archaeology. It makes the case for a more radical way for archaeology to embrace a broader set of disciplines going forward, in particular by deepening its relationship to the social sciences, and advocates for the importance of disciplinary literacy."

7

### LET'S TALK ABOUT IT. THE IMPORTANCE OF COMMUNICATION AND TRANSLATION IN INTERDISCIPLINARY COOPERATION

**Abstract author(s):** van Helden, Daniël (University of Leicester)

**Abstract format:** Oral

While boundaries between disciplines are indeed historical relics, and therefore not a natural given, to call them arbitrary is perhaps an overstatement. In archaeology we are used to the idea that although human behaviour is not law-governed in the same way that natural processes are, neither are the results of this behaviour random. Thus, while many outcomes are possible from a historical situation, they are not equally probable. I would argue that, even though the exact position of disciplinary boundary is arbitrary, coarse divisions do exist with the sciences (understood inclusively to contain the humanities as well as the natural sciences).

It is these underlying divisions that really characterise the challenge of interdisciplinarity. People communicate and think in different ways in different fields. This should not be overstated, it does not reflect some Kuhnian incommensurability, but through training people are 'disciplined' in ways that are specific to their chosen field. This divergent disciplining is like speaking different languages; it is not impossible to communicate, but it takes effort. Most problems with interdisciplinarity reduce to such communication difficulties; from misunderstandings within projects to different ways of communicating results (i.e. problems with publishing in outlets that are judged by disciplinary codes).

Fundamentally, the only solution to a communications problem is more communication. Using real-life examples, I will argue that there is a crucial role for 'translators' in truly successful interdisciplinary work. It is such translators that, through speaking multiple disciplinary languages, enable bridging the, very real, communication gaps. Without them, interdisciplinarity is often just juxtaposition of different disciplinary results without much connection between them.

Interdisciplinarity has real potential, but it requires explicit, dedicated, attention to communication to be more than a fashionable buzzword.

8

### METHODOLOGICAL ANARCHISM AGAINST INTERDISCIPLINARITY: BREAKING DOWN METHODOLOGICAL WALLS

**Abstract author(s):** Ribeiro, Artur (Christian-Albrechts-Universitat)

**Abstract format:** Oral

It seems that any archaeological project that wants to be funded and noticed by peers requires incorporating something called "interdisciplinary research". A brief perusal through the titles and abstracts of the sessions at this EAA conference shows that around 40 to 50 of them contain the word 'interdisciplinary' or some other variation of this term. Yet, to paraphrase Alexandra Ion, one should ask: how interdisciplinary is interdisciplinarity?

This paper will argue two points: first, interdisciplinary research, as it is practiced in archaeology today, is detrimental to the progress of the discipline. Interdisciplinarity has simply become a buzzword that attracts funding by making archaeology more scientific.

By being more scientific, the chances of publishing in high-ranking journals is enabled, which in turn, guarantees further funding. Additionally, the methods of the human and cultural sciences are suppressed in interdisciplinary research – the objects of analysis traditionally studied by the human and cultural sciences are reduced to proxies or quantifiable metrics, which are then used primarily to reach consilience with the hypotheses established by the natural sciences.

Second, this paper will also argue that the use of natural science techniques does not provide a more accurate, objective, or factual perception of the past, as opposed to the human and cultural sciences, only a different form of knowledge. In short, what is needed in archaeology is not necessarily interdisciplinarity, but rather methodological anarchism. From a methodological anarchist standpoint, what is valued is the information that can be obtained regardless of method or discipline. Additionally, methodological anarchism favours different forms of knowledge, not just more knowledge of the same kind. Finally, methodological anarchism breaks down walls concerning what is conventionally or implicitly considered "high-quality" research, opening up the discipline to ideas and methods that have been ignored for far too long.

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### PLANTS MEET ARTIFACTS: DEVELOPING INTERDISCIPLINARY APPROACHES TO IDENTIFY PLANT PROCESSING AND USE IN ARCHAEOLOGY [ARCHAEOLOGY OF WILD PLANTS]

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Arranz Otaegui, Amaia (Dept. of Cross Cultural and Regional Studies, University of Copenhagen) - Cubas, Miriam (Dept. of History and Philosophy, Universidad de Alcalá) - Rosenberg, Danny (Zinman Institute of Archaeology, University of Haifa) - Ibáñez, Juan José (Instituto Milá i Fontanals, Consejo Superior de Investigaciones Científicas)

**Format:** Regular session

Archaeologists have long searched for methods to identify the use and function of prehistoric artefacts. The increasing application of use-wear, molecular and experimental approaches to the study of pottery vessels, flint and ground stone tools have provided crucial new insights into prehistoric tool use. However, whereas analytical methods to identify animal-derived resources are relatively well established, direct evidence for plant processing, use and consumption continues to be largely "hidden" in the archaeological record.

The aim of the session is to bring together specialists on the study of different archaeological artefacts (e.g. pottery, ground stone and flint tools), archaeobotanists (plant macro- and microremains), biomolecular archaeologists (organic residue analyses) and researchers specialized on experimental archaeology to discuss current approaches to identify the preparation and use of plant resources in the past.

We encourage problem-based interdisciplinary case studies that combine multiple lines of evidence to solve a particular question or hypothesis. Presentations highlighting the potentials and limitations of the different methods in use will also be welcome, as well as those applying new techniques or material studies (e.g. charred food crusts). Research themes are open (e.g. food preparation, processing, cooking, raw materials...), and contributions from all periods and geographic regions are generally welcome.

At the end of the session, we will organize a round table to discuss sampling and study protocols that allow multi and inter-disciplinary approaches to be implemented and guarantee the comparability of results between sites.

### ABSTRACTS

1

### STRIPPING GRAINS – AN EARLY CEREAL PROCESSING TECHNIQUE REVEALED THROUGH USE-WEAR ANALYSIS AND EXPERIMENTAL ARCHAEOLOGY

**Abstract author(s):** Groman-Yaroslavski, Iris - Barshay, Katerina - Koporovsky, Maya (University of Haifa; Zinman Institute of Archaeology)

**Abstract format:** Oral

Flint sickle blades begin to appear on a regular basis in the Levant during the Late Epipaleolithic period ca. 15,000 BP. They are considered a Natufian innovation in the southern Levant, representing intensification in the exploitation of cereal resources. In a use-wear analysis conducted lately on sickle blades from several archaeological sites, a feature in the shape of transversal striations associated with the cereal use-wear polish was noticed and investigated. This feature appears on items from a Natufian context through the Pre-Pottery Neolithic period, indicating the use of the specific technique of stripping to remove the grains from the stems after the harvest. Experimentation replicating such an activity, applied to wild barley and domesticated emmer wheat explains the purpose and advantages of this technique. Using different types of sickles, equipped with different types of cutting blades, the stripping technique was found to be efficient for separating the grains from the stems and also acts as a threshing device for dehusking. We propose a new reconstruction of a processing sequence, characterizing the earliest stages of inventing cereal harvesting and processing technologies, before the age of threshing floors and tribulum. We present indicative microscopic traces and results of the experimental program, compared to some archaeological examples from the southern Levant.



2 UNVEILING HARVESTING IN THE NEOLITHIC: VARIABILITY IN USE-WEAR POLISH FROM CEREAL REAPING THROUGH CONFOCAL MICROSCOPY

**Abstract author(s):** Ibáñez, Juan (Spanish National Research Council - CSIC) - Mazzucco, Niccolò (Spanish National Research Council - CSIC) - Anderson, Patricia (CEPAM - UMR 7264 - CNRS) - Gassin, Bernard (Université Toulouse II - Jean Jaurès | UTM · UMR TRACES)

**Abstract format:** Oral

Wheat, barley and rye were harvested in the wild during the Late Epipaleolithic in the Near East. From 8,500 cal BC first indications of domestication appear in north and south Levant. After that, beside domestic hulled cereals, wild varieties were also exploited during more than one millennium. From 7,500 cal BC naked varieties of domestic cereals started to be exploited in the Near East. Domestic cereals were spread into Europe, Asia and North Africa during the Neolithic expansion, being cultivated in very different ecological contexts. Cereals were harvested in a more or less advanced stage of maturity and more near the ground or the ear, depending, partially, on whether the straw was going to be used or not. All this variability in harvesting conditions resulted in an important variability in cereal reaping polish characteristics. We explore this variability in an ample experimental program of harvesting tools, using texture analysis and confocal microscopy in order to measure it. We conclude that important aspects about the characteristics of harvesting activities in the past can be unveiled using this methodology.

3 GOING BEYOND THE BAMBOO HYPOTHESIS: EXPLORING PLANT PROCESSING PRACTICES IN PREHISTORIC SOUTHEAST ASIA

**Abstract author(s):** Khaufair, Hermine - Ibanez, Juan (Consejo Superior de Investigaciones Cientificas) - Jago on, Sheldon (National Museum of the Philippines)

**Abstract format:** Oral

The prehistory of SE Asia is very different from the rest of the Old World. The stone tool kit is rudimentary and production techniques lasted unchanged for millennia. Currently, the dominant hypothesis to explain it is the “Bamboo Hypothesis”: prehistoric hunter-gatherers would have adapted to their environment, the tropical forest and manufactured more complex implements in a perishable material: bamboo. Nevertheless, archaeobotanical remains, use-wear and residues observed on stone tools show that several species were known and used by Southeast Asian prehistoric groups. Therefore, we can hypothesise that the simplification of lithic technology could be due to a technological investment focusing on a large spectrum of plants and not only on bamboo. To investigate this question further, and possibly reveal a hidden complexity in Southeast Asian Prehistory, we are conducting qualitative and quantitative use-wear and micro-residue analyses on different stone tool assemblages from Palawan Island, Philippines, dating to Late Pleistocene/Early Holocene.

4 OF PLANTS AND GRINDING STONE TOOLS: PHYTOLITH AND USE-WEAR FUNCTIONAL EVIDENCE FROM EARLY NEOLITHIC LA MARMOTTA (LAKE BRACCIANO, ITALY)

**Abstract author(s):** Portillo, Marta (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017SGR 995, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Hamon, Caroline (CNRS-UMR 8215 Trajectoires Maison de l’archéologie, Nanterre cedex) - Remolins, Gerard (ReGiraRocs S.L., Research, Conservation and Dissemination. Cultural and Natural Heritage of the Pyrenees. Escaldes-Engordany) - Mazzucco, Niccolò - Gibaja, Juan Francisco (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017SGR 995, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Mineo, Mario (Museo delle Civiltà / Museo Nazionale Preistorico Etnografico “L. Pigorini”, Rome)

**Abstract format:** Oral

The early Neolithic site of La Marmotta (Lake Bracciano in Italy, 5700-5300 cal BC) presents a range of ground stone tool assemblages, in addition to extraordinary preservation of organic material by water-logging. We conducted integrated spatial, technological, functional and phytolith analyses in an effort to gain a better understanding of tool use, processing activities and their spatial distributions. The use-wear results points to several systems of grinding. Together with back-and-forth narrow or more massive querns, several grinding slabs were used in a circular motion. Typical bread-shaped grinders dominate the assemblages, though overlapping and one hand grinder are also present. Though no mortar have been identified in the site, rare pestles of massive or small dimensions, attest of pounding activities. Use-wear observations suggest that grinding tools were probably involved at different stages of food processing, and for different purposes. Phytoliths indicated the nature of the processed material, dominated by Pooideae grasses including major cereals such as barley and wheat which are consistent with the macrobotanical record. The size of multicellular phytoliths from tool surfaces further supports dehusking activity, according to experimental datasets obtained through the processing of cereals, including hulled barley (*Hordeum vulgare*) and einkorn wheat (*Triticum monoccum*) which dominated the site archaeobotanical records along with emmer and free-threshing wheat. This integrated approach showed patterns related to plant-processing, including the grinding, pounding and dehusking of cereals. These findings further highlights the importance of integrating different lines of evidence, as well as the value of comparative experimentally-produced records for a better understanding of tool use and plant-processing activity.

5 THE EPIPALAEOLITHIC-NEOLITHIC TRANSITION: WHAT DO WE KNOW (AND WHAT WE DON’T) ABOUT FOOD PROCESSING TOOLS (AND FOOD)

**Abstract author(s):** Rosenberg, Danny (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa)

**Abstract format:** Oral

The Epipalaeolithic-Neolithic transition in the southern Levant is evident in many aspects of the material remains, and reflects pronounced a culture exhibiting cardinal changes in subsistence economy, social behavior, and symbolism. Some of the most fundamental changes are documented for ground stone tool assemblages, that seems to reflect some of the most notable shifts of food processing techniques during this time span. The shift from pounding to grinding as the main food processing technique is one of the most notable changes documented, however other changes and preferences were noted as well, including shifts pertaining to context and discard patterns, typo-morphological variations, raw material selection and variability in stylistic characterization. The current paper offers an overview of this intriguing changes and discusses also the botanics remains found in the south-Levantine sites and test the possible links between stone food processing tools and the possible botanical resources they were used to process, during the transition from hunting and gathering to agriculture and sedentary way of life in this region.

6 PRELIMINARY KEY OF STARCH GRAINS FROM EDIBLE PLANTS FOR THE ARCHAEOLOGICAL RECORD OF THE EASTERN MEDITERRANEAN

**Abstract author(s):** Ahituv, Hadar (Institute of Archaeology, Martin (Szusz) Department of Land of Israel Studies and Archaeology, Bar-Ilan University) - Henry, Amanda (HARVEST Project, Faculty of Archaeology, Leiden University)

**Abstract format:** Oral

Amongst archaeological micro-remains, starch grains can be used as an archaeobotanical tool for reconstructing ancient environments, diets, and trade through the identification of the plants collected and consumed by ancient populations. The identification of starch grains preserved in dental calculus and on stone tools is a promising method for recovering additional dietary information, and has been successfully used at a few sites in Israel alongside hundreds of sites around the world. However, the ability to identify the archaeological starch grains relies on having a broad (i.e., many taxa) and deep (i.e., many individuals from the same taxon) reference collection from modern plants. No such collection exists for Israeli taxa. In this research we develop such a reference collection, and build a key for identification based on the prominent morphological features, based on 150 modern eastern mediterranean plant species. The selection of modern species follows two guidelines: plants which are known from the archaeological record and edible plants. This will allow us to identify wild and domesticated plants that remained part of the diets of early agricultural populations. The use of starch grains as an archaeobotanical tool can expand our knowledge of the archaeological sites and its inhabitants, particularly when other botanical remains are not preserved.

7 CHARRED FOOD CRUST: EVIDENCE OF FOOD PROCESSING, DIET, AND RADIOCARBON DATING

**Abstract author(s):** Scott Cummings, Linda - Varney, R. A. (PaleoResearch Institute) - Stafford, Jr., Thomas (Stafford Research Laboratories)

**Abstract format:** Oral

Charred Food Crust that comprises black, crusty residue on the rims and interior of ceramic vessels and sherds, is a record of foods prepared that may be examined as fats/lipids, organic residues using FTIR, pollen, phytoliths, and starch. These tools allow identification of the general presence of animal products and identification of specific plants cooked in the vessels. In addition, research indicates that radiocarbon dating this charred crust can provide dates that are either accurate or affected by a freshwater reservoir effect. Our research into laboratory techniques to remove more organic compounds than those typically removed by acid-base-acid processing, has yielded success in obtaining dates concordant with those on associated charred annual remains. We examined evidence that suggests fats/lipids and at least some (or most) of the proteins and amino acids in the charred food crust can be remained, leaving a charred crust the comprises primarily carbohydrates. When this is possible, radiocarbon dates are in agreement with those on associated charred annual remains that were not recovered from the ceramic. Occasionally, however, we find that the charred remains contained ancient carbon integrated into the food that was charred. In cases where the remains were thoroughly carbonized, we examined techniques that others use to “uncook” proteins, with very limited success. This presentation brings together the results of our analyses, discussing their relevance to better understanding food, diet, and radiocarbon dating.

8 FOODCRUSTS UNDER THE MICROSCOPE: IDENTIFICATION OF PLANT REMAINS IN EARLY POTTERY VESSELS FROM NORTH-EAST EUROPE

**Abstract author(s):** González Carretero, Lara (The British Museum; Museum of London Archaeology - MOLA)

**Abstract format:** Oral

The analysis of charred organic surface deposits or ‘foodcrusts’ from pottery, often believed to represent the accumulation of food products during one or several cooking events, are essential for the understanding of prehistoric foodways. Macroscopic and microscopic analyses of ‘foodcrusts’ have the potential for the identification of plant and animal resources used by past communities and how these were combined and/or cooked, as well as about the function of early pottery vessels. This paper draws attention to the

9 need for a combined approach for the study of ‘foodcrusts’ using digital microscopy, Scanning Electron Microscopy (SEM) and organic chemical analyses. Preliminary results from the INDUCE Project, funded by the European Research Council (ERC), on ‘foodcrusts’ preserved inside hunter-gatherer vessels from sites located in North-East Europe are presented here. These show differential use of pottery vessels for the processing and preparation of plant and animal foods and shed light on culinary practices during the Early Neolithic in Europe.

## 9 WHAT’S IN THE COOKING POTS? - SEM AND LIPID ANALYSES ON FOODCRUSTS FROM THE EARLY NEOLITHIC IN THE NETHERLANDS

**Abstract author(s):** Kubiak-Martens, Lucy (BIAX Consult, Biological Archaeology & Environmental Reconstruction, Zaandam) - Demirci, Özge (Groningen Institute of Archaeology, Groningen) - Lucquin, Alexandre (BioArch, Department of Archaeology, University of York)

**Abstract format:** Oral

This research aims to understand the use of pottery from one of the Early Neolithic Swifterbant Culture sites -S4 (4300-4000 cal BC), in the Netherlands by combining different methodological approaches to the study of charred foodcrusts and to pottery analysis. The broad-spectrum subsistence economy of the site included wild and domestic animals, aquatic food resources, local cereal cultivation, and the gathering of wild plants. Although the early pottery from this site has been extensively studied, its function and the extent of its use have remained the subject of an ongoing discussion.

Food residues, either found firmly encrusted on the pottery or extracted as lipids that were absorbed into the pottery, are considered to reflect the original vessel contents. They provide an optimal source of information about how people prepared their daily meals and what pots were used. The study of food crusts and the analysis of the extracted lipids, however, is a complex matter and a single research method is never sufficient to fully understand daily cooking practices in prehistory.

Therefore, in our research, three different disciplines, each with its own highly sensitive methodology, were combined to identify the use of the S4 pottery. The SEM (Scanning Electron Microscope) was used to study tiny fragments of cereal and other plant tissues that survived the processes of food preparation and cooking. Bulk stable isotope analysis of the foodcrust and the lipid residue analysis on the pottery were used to detect and differentiate specific biomarkers for ruminant, non-ruminant, aquatic and dairy food resources. The results from these three disciplines were joined together in our search for a better understanding of the use of Swifterbant pottery. This is the first time in Dutch archaeology that these methods were combined and successfully applied to a series of examples from the Early Neolithic Swifterbant sites.

## 10 INTERDISCIPLINARY ANALYSES OF TUBER GATHERING, PROCESSING AND CONSUMPTION: EXPERIMENTAL ARCHAEOLOGY IN ACTION

**Abstract author(s):** Pedersen, Patrick - Arranz-Otaegui, Amaia - Jörgensen-Lindahl, Anne (Department of Cross-Cultural and Regional Studies, University of Copenhagen)

**Abstract format:** Oral

Ethnographic evidence shows that underground storage organs (USO) represent one of the most important plant-foods consumed by modern hunter-gatherers. At the early Natufian site of Shubayqa 1 (14.4-14.2 ka cal. BP, northeastern Jordan), thousands of club-rush tubers (*Bolboschoenus glaucus*) were identified in two fireplaces, indicating their recurrent roasting. To understand how these plants were gathered, processed and consumed, an interdisciplinary framework was designed where experiments with modern equivalents formed the basis. The work combined ethnographic data, taphonomic analyses of modern club-rush tubers, and use-wear analysis of the experimental groundstone and flint tools. To start, club-rush tubers were gathered by lake Burqu, the closest modern lake area to the site. The best season for tuber collection was evaluated, and different gathering methods tested. The tubers were peeled in multiple ways: by hand, using flint tools and by roasting. The clean tubers were subsequently processed using both mortars and grinding slabs, and the resulting plant products evaluated in terms of the size and shape of the particles. The tuber flour was mixed with wheat flour at different proportions and the dough cooked on the ashes of a fireplace and on top of heated basalt stones. The results of these experiments allow us to evaluate some of the options for the gathering, processing and cooking of club-rush tubers in the past. The experimental plant remains as well as the lithics produced during the different experimental stages will be essential to interpret the archaeological remains found at Shubayqa 1.

## 11 INVESTIGATING LATE-NEOLITHIC HUSKING TRAYS THROUGH INTEGRATED USE-WEAR AND PHYTOLITH STUDIES

**Abstract author(s):** Taranto, Sergio (Department of Prehistory, Autonomous University of Barcelona; LTFAPA. Laboratory of Technological and Functional Analyses of Prehistoric Artefacts, Department of Classics, Sapienza University of Rome) - Portillo Ramirez, Marta (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017SGR 995, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Gomez Bach, Anna - Molist Montaña, Miquel (Department of Prehistory, Autonomous University of Barcelona) - Le Miere, Marie (Associate Researcher, Archéorient, CNRS-Université Lyon 2) - Forte, Vanessa - Lemorini, Cristina (LTFAPA. Laboratory of Technological and Functional Analyses of Prehistoric Artefacts, Department of Classics, Sapienza University of Rome)

**Abstract format:** Oral

The so-called husking tray is a pottery shape attested during the 7th and the first half of the 6th millennium BC in the Near East. These vessels are large trays with surfaces crossed by scored patterns. It has been hypothesized a functionality related to cereal-processing and bread making, further supported by ethnographical and experimental evidence.

The Neolithic site of Tell Sabi Abyad (northern Syria) has provided diverse ceramic material including storage vessels, as well as a wide range of macrobotanical remains such as hulled barley, emmer wheat, lentil, chickpea and flax. The results of use-wear and phytolith analyses from a selection of husking tray assemblages from the Late Neolithic settlement are discussed here. Use-wear distributions over their surfaces showed patterns related to the detachment of plant foods such as ‘bread-like’ materials, according to experimentally-produced records. In turn, phytolith results indicated the nature of the plant material adhered to the vessel surfaces which is dominated by Pooideae grasses. Multicellular or anatomical connected phytoliths from the husks of wheat and barley were common in these assemblages. Overall, these results suggest a functionality related to the processing of cereals into bread. This integrated approach further supports the hypothesis that husking trays were used for baking to better understand Late Neolithic culinary practices.

## 12 IDENTIFYING ANDEAN CROP PROCESSING AND CONSUMPTION IN THE AREA OF QUEBRADA DE HUMAHUACA (ARGENTINA) UNDER INCA DOMINATION

**Abstract author(s):** Musaubach, Maria (Facultad de Humanidades y Ciencias Sociales. Universidad Nacional de Jujuy; InDyA - CONICET, UNJu, UNT, Gob. de Jujuy) - Scaro, Agustina (INECOA - CONICET, UNJu; Facultad de Humanidades y Ciencias Sociales. Universidad Nacional de Jujuy)

**Abstract format:** Oral

Cooking practices were an integral part of the political, social and productive life of pre-Hispanic communities. During the Inca domination, new cooking and commensality practices were put into practice for the first time, which brought together new forms of status and social recognition. This paper focuses on Andean crop processing techniques and consumption during the Inca period. Through inter-disciplinary analyses of plant-foods and ceramic vessels we investigate culinary practices associated to domestic and non-domestic elite contexts and evaluate the role of different foods for the Inca communities of the area of Quebrada de Humahuaca (North of Argentina). The analysed materials were recovered at two major archaeological sites in the southern part of Quebrada de Humahuaca, called Pucara de Volcán and Esquina de Huajra. They are conglomerated settlements with an Inca occupation dated to circa 430 BP. In order to study culinary techniques we followed and developed two main approaches: archaeobotanical studies of plant micro-remains and use-wear analysis of pottery. The first study was carried out on grinding stone tools recovered in Pucara de Volcán and dental calculus of two individuals buried in Esquina de Huajra. Use-wear analysis was carried out in ceramic vessels from both sites, and abrasive and non-abrasive processes were considered to infer functional aspects linked to plant processing activities. These analyses are complemented with the contextual study of the materials, to highlight differences between domestic and non-domestic contexts. The results of this study highlight that Zea mays (maize), Phaseolus sp. (beans) and tubers were important ingredients of ancient recipes. The presence of diverse grinding stone tools indicates the preparation of flour. Finally, vessels with traces of soot and abrasive processes point out to the processing of stew-like foodstuffs.

## 13 MOTE: AN ANCIENT RECIPE IN ANDEAN KITCHENS. EXPERIMENTAL AND TAPHONOMIC ANALYSIS

**Abstract author(s):** Musaubach, Maria (Facultad de Humanidades y Ciencias Sociales. Universidad Nacional de Jujuy; InDyA - CONICET, UNJu, UNT, Gob. de Jujuy) - Scaro, Agustina (INECOA - CONICET, UNJu; Facultad de Humanidades y Ciencias Sociales. Universidad Nacional de Jujuy)

**Abstract format:** Oral

Mote or muti is a traditional Andean recipe that can be traced to pre-Hispanic kitchens. This culinary practice consists of boiling maize grains that were previously dried and peeled with lime or plant ashes (nixtamalization). According to early Spanish sources, this dish forms the dietary staple of common people. Currently, this recipe is also prepared with wheat grains, although maize remains the most important ingredient. Given the difficulty to reconstruct past cooking practices, in this opportunity, food processing pathways of mote preparation in Quebrada de Humahuaca (South-central Andes) are presented to generate indicators for its identification in the archaeological record, concerning both plant macro and micro-remains and the culinary equipment used.

A combined approach that includes ethnobotany, ethnography, experimentation, and archaeological methodologies led us to recre-

APPROACH TO PLANT-CRAFTS TECHNIQUES FROM THE BASAL MAT IMPRINTS OF BRONZE AGE CERAMICS IN THE NORTHEAST OF IBERIAN PENINSULA

**Abstract author(s):** Piqué, Raquel - Bodganovic, Igor (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Homs, Anna (Independent researcher) - López-Bultó, Oriol (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Palomo Pérez, Antoni (Museu d’Arqueologia de Catalunya) - Romero-Brugués, Susana - Tzerpou, Evdoxia (Universitat Autònoma de Barcelona, Departament de Prehistòria)

**Abstract format:** Oral

Prehistoric evidence of plant crafts is scarce in the Iberian Peninsula. The few sites that have provided samples of baskets are restricted to the Southeast of Iberia where dry conditions have favoured the conservation of plant-based implements as textiles, baskets, and ropes. In the Northeast of Iberia, the environment is not appropriate for this type of the conservation and the examples are still rarer, but it should be mentioned the waterlogged early Neolithic site of La Draga (Banyoles) or bronze age contexts of the Cova dels Moros d’Alins (Alins) where fragments of baskets have been preserved. Indirect evidence of craft plant techniques are the imprints of mats and baskets in the base of ceramic pots. They appear in Northeast of Iberia in chronologies of Early Bronze age (circa 2000-1500 BC). Although these pots have been usually studied from the perspective of pottery little attention has been paid with respect to their significance in terms of crafts technology. The objective of this paper is to study mats imprints to provide light on the evolution of plant crafts technology in Northeast Iberia. We combine 3D scanning and experimentation to identify the craft technics of Cova Fonda (Salomó), Cova de Vallmajor (Albinyana), Cova del Foric (Os de Balaguer) and Banys de la Mercè (Capmany) where several pieces with basal mats imprints have been recovered. The imprints allow identifying coiling techniques and details of the production process of mats.

USE OF PLANTS BY THE FUNNEL BEAKER CULTURE COMMUNITIES IN POLAND

**Abstract author(s):** Sobkowiak-Tabaka, Iwona - Rennwanz, Joanna (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań)

**Abstract format:** Oral

Plants played an extremely important role in the Funnel Beaker Culture (TRB). Apart from their primary value as a source of food, they were used in many different fields of life of TRB communities at that time. In this paper we present the findings from several archaeological sites of sedimentary type from Poland.

We selected materials, each time precisely related to the archaeological context, such as macroscopic plant remains, fragments of ceramic vessels and daub containing plant imprints, mineralized plant tissues chose from clay, and numerous charcoals. These sources were obtained primarily from economic pits of various purposes and the remains of residential buildings. Both stereoscopic and scanning electron microscopes were used to identify them. We try to indicate the compatibility of sources and methods used, especially in the case of reanalysis of archival materials.

In the paper, we discuss the importance of plants in the economy of the TRB community, especially in the context of their cultivation, storage and processing. A particularly interesting was to learn the technique of ceramic vessel production in terms of the organic admixture used, the use of plants, including fibrous species and wood, at various stages of construction of residential houses and accompanying infrastructure, linking them with the calendar of economic activities, as well as a detailed case study indicating the use of plants for medicinal purposes.

We present new data, including the first identifications of some species for TRB culture from present-day Poland.

a. COMBINING USE-WEAR AND RESIDUE ANALYSES OF GRINDING STONES AND EXPERIMENTAL STUDIES TO DETERMINE PLANT USE AT EARLY NEOLITHIC GÖBEKLI TEPE

**Abstract author(s):** Dietrich, Oliver - Dietrich, Laura (Deutsches Archäologisches Institut) - Meister, Julia (Julius-Maximilians-Universität Würzburg)

**Abstract format:** Poster

The well-known site of Göbekli Tepe (9.600-8.000 cal BC) consists of monumental round to oval buildings with richly decorated T-shaped pillars, erected in an earlier phase, and smaller rectangular buildings, built around them in a partially contemporaneous and later phase. Among the finds from the site, the number of tools related to food processing, including grinding slabs/bowls, hand-stones, pestles, and mortars, is striking. We analyzed more than 7000 artifacts. This high frequency is unusual for contemporary sites in the region. Using an integrated approach of formal, experimental, and macro- / microscopical use-wear analyses we show

that Neolithic people at Göbekli Tepe have produced standardized and efficient grinding tools, most of which have been used for the processing of cereals. Additional phytolith analysis confirms the massive presence of cereals at the site, filling the gap left by the weakly preserved charred macro-rests. The organization of work and food supply has always been a central question of research into Göbekli Tepe, as the construction and maintenance of the monumental architecture would have necessitated a considerable work force. Contextual analyses of the distribution of the elements of the grinding kit on site highlight a clear link between plant food preparation and the rectangular buildings and indicate clear delimitations of working areas for food production on the terraces the structures lie on, surrounding the circular buildings.

COLLABORATIVE SYNTHESIS: THE EAA-SAA HUMAN MIGRATION PROJECTS

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Altschul, Jeff (Coalition for Archaeological Synthesis; SRI Foundation) - Richards, Julian (Archaeology Data Service, University of York) - Kintigh, Keith (Coalition for Archaeological Synthesis; Arizona State University)

**Format:** Regular session

In 2019, the European Association of Archaeologists (EAA) and the Society for American Archaeology (SAA) sponsored a Coalition for Archaeological Synthesis (CfAS) design workshop on human migration as understood from a long-term perspective. The workshop included 15 participants from seven countries, representing work on six continents, ranging from the Paleolithic to homeless migrants, with expertise that varied from aDNA to ethnography. The objective of the workshop was to develop proposals for collaborative synthetic projects that focused on establishing the factors stimulating human migration, the conditions and processes implicated in the success of the incorporation of immigrant groups at their destination, and how these new understandings might inform contemporary public policy. Three project ideas emerged from the workshop: (1) climate migrants of the past, present, and future; (2) leveraging archaeology for migrations of the present (LAMP); and (3) long-term effects of past migrations on human security. In this session we will discuss the origins and outcomes of the workshop, update the status of each project and how EAA members can become involved. Presenters also will inform on the importance of using archaeology to understand contemporary migration with case studies from Hungary and statements from the EAA and SAA.

ABSTRACTS

THE ORIGIN AND OUTCOME OF THE EAA-SAA DESIGN WORKSHOP ON HUMAN MIGRATION

**Abstract author(s):** Altschul, Jeff (SRI Foundation; Coalition for Archaeological Synthesis)

**Abstract format:** Oral

In 2019, the Coalition of Archaeological Synthesis (CfAS) held a design workshop on understanding human migration from a long-term perspective. The workshop, co-sponsored by the European Association of Archaeologists (EAA) and the Society for American Archaeology (SAA), grew out of a frustration that the public debate shaping migration policy was not informed by research into the deep-rooted social processes that affect migration. To change this dynamic, EAA and SAA turned to CfAS, which uses a model of collaborative synthesis that relies on face-to-face interaction by small, diverse groups of experts to provide evidenced-based results that inform on issues facing modern society. CfAS invited 15 participants, representing seven countries and research from six continents. Starting from the United Nations’ position that every person is entitled to human security, the participants outlined three conceptual projects for which archaeological data are essential: (1) establishing global, historic variation in rates of migration at regional and community levels; (2) examining how the characteristics of past migrations affect different dimensions of human security; and (3) identifying the social conditions that make societies more vulnerable to climate-related migration. In this session, each of these projects will be presented in greater detail along with their current status. We also discuss what we have learned through this process and how it will shape the future direction of CfAS and the Center for Collaborative Synthesis in Archaeology. Finally, we will hear from the leadership of the SAA and EAA about the importance of synthetic research on issues of relevance to modern society.

CLIMATE MIGRANTS OF THE PAST, PRESENT, AND FUTURE

**Abstract author(s):** Aldenderfer, Mark (University of California, Merced) - Bird, Douglas - Douglass, Kristina (Pennsylvania State University) - Gauthier, Nicolas (University of Arizona) - Ingram, Scott (Colorado College) - Scaffidi, Beth (Arizona State University)

**Abstract format:** Oral

The world’s Indigenous peoples are among those most dramatically affected by the increasingly rapid pace of global climate warming and many will become climate-related migrants, losing both their homelands and lifeways. Although contemporary social scientists have studied climate-related migration and its outcomes intensively, little consensus has been reached to define the most significant social and environmental factors that promote or constrain migration and that may have been responsible for creating conditions of vulnerability in the societies confronted by climate change. This situation has been worsened by a failure to consider the historical contexts of migrations and the ways in which past decisions have affected modern outcomes. Our project, one of the three proposals initiated by the 2019 CfAS workshop on migration, proposes that comparative, synthetic archaeological research offers a powerful way to explore systematically the interaction of social and ecological factors within contexts of climate-related migra-



tion and thus contribute a historical and social perspective useful to the contemporary world. Our project seeks to address both scientific and public policy goals to identify conditions that have influenced human decisions to migrate in response to changing climatic conditions and support local, Indigenous, and descendant communities in building effective strategies to adapt to current and future climate change. Framing our research using an archaeological implementation of the human security approach developed by the United Nations Development Programme, we will create a crowdsourced database of global scope to collect and synthesize archaeological examples of climate-related migration from 4000 BP to CE 1750. In this presentation, we outline the project and its key elements with a focus on how we will use the findings of this research to work with select Indigenous communities currently impacted by a rapidly warming world.

3 **LEVERAGING ARCHAEOLOGY FOR MIGRATIONS OF THE PRESENT: DOCUMENTING, SYNTHESIZING, AND UNDERSTANDING HUMAN MIGRATION**

**Abstract author(s):** Alonzi, Elise (University College Dublin; Arizona State University) - Armit, Ian - Bickle, Penny (University of York) - Isayev, Elena (University of Exeter) - Niccolucci, Franco (PIN) - Ortman, Scott (University of Colorado Boulder) - Scaffidi, Beth (Arizona State University)

**Abstract format:** Oral

What rate of mobility represents the ‘norm’ of human experience? We believe that to understand the true impact of a projected increase in migration due to factors such as climate change, political instability, and others, we need to reliably quantify the everyday levels of mobility experienced in the past. In this proposed project, developed under the umbrella of the Coalition for Archaeological Synthesis, we seek to study the rates of movement that occurred outside of the mass migration events that have typically dominated archaeological discourse. We will develop new methods to combine bioarchaeological isotope and historical census data into a coherent picture of mobility in the past and avail of data aggregators such as tDAR in the United States and ARIADNE in Europe. Case studies from time periods with relatively settled communities and areas with rich archaeological contextual data will be targeted to calculate the percentage of non-locals at each site. The selection criteria are: (1) data availability, (2) sample populations in excess of ten individuals (to allow for statistical robusticity), and (3) clear description of methods so that reliability and comparability may be assessed. New statistical methods will be developed in order to equate different forms of data and to quantify levels of uncertainty. Our plans include utilizing publishing and outreach approaches to bring our results to bear on contemporary perceptions of population movements. The findings of this proposed project will allow closer inspection of contexts that may be considered ‘crisis’ scenarios within a longue durée fluctuating baseline of mobility.

4 **THE COALITION FOR ARCHAEOLOGICAL SYNTHESIS, THE CENTER FOR COLLABORATIVE SYNTHESIS IN ARCHAEOLOGY, AND THE ROLE OF SYNTHESIS IN ARCHAEOLOGY**

**Abstract author(s):** Kintigh, Keith (Arizona State University; Coalition for Archaeological Synthesis) - Ortman, Scott (University of Colorado; Center for Collaborative Synthesis in Archaeology; Coalition for Archaeological Synthesis; Santa Fe Institute)

**Abstract format:** Oral

Synthesizing archaeological data and knowledge to advance understandings of the human past and address contemporary social issues is a challenge of international scope and importance. The archaeological synthesis initiative we are building requires not only the commitment energy, and ideas of engaged archaeologists across the globe, but also leadership, funding, and organizational infrastructure.

The Coalition for Archaeological Synthesis (CfAS) is coalition of partner organizations and individual associates whose collective capacities are being leveraged in the pursuit of collaborative syntheses that address contemporary social and environmental challenges. The University of Colorado Center for Collaborative Synthesis in Archaeology (CCSA) provides administrative and logistical support for grants and programs the joint CfAS/CCSA leadership decides to pursue. This presentation begins with a discussion of the importance of policy-oriented synthetic research to the future of archaeology and some ideas on how to achieve this. We then describe these complementary organizations and how they are working together to implement project ideas emanating from the EAA/SAA-sponsored migration design workshop, and to advance collaborative synthesis in archaeology both in the US and internationally.

5 **HUMAN MIGRATION – A VIEW FROM HUNGARY**

**Abstract author(s):** Banffy, Eszter (RGK - Romano-Germanic Commission DAI)

**Abstract format:** Oral

The Carpathian Basin has always been a melting pot, beginning with the Neolithisation, the Steppe Yamnaya people, over the Celts and the Romans to the so-called Migration period. Germanic tribes (Langobard, Gepida, Suebic etc. groups), Central Asian people such as the Huns, Sarmatians, Avars, Bulgarians and eventually, the Hungarian tribes, already having been a mixture of Uralian, Finno-Ugric and central Asian Turkish elements built a real palimpsest. It continued to flourish in high medieval times, as many Cumanian, Slavic, Saxonian or Danube Swabian groups were invited by Hungarian kings into underpopulated regions, especially after wartime. What would remain of the past prehistoric and historic events without an always repeated input of migrants? Mobility, as it is often stressed, the number one triggering effect of social changes. In the light of this, the irony in the attitude of the current Hungarian government, to defend a “pure nation country” at the start of the migration crisis becomes apparent. The talk will focus

on relevance of migration narratives to archaeology – what role can archaeology play, to help?

6 **PROFESSIONAL ARCHAEOLOGICAL SOCIETIES AND THE ARCHAEOLOGICAL STUDY OF HUMAN MIGRATION AND ITS RELATION TO MODERN SOCIETY**

**Abstract author(s):** Majewski, Teresita (Statistical Research, Inc.) - Watkins, Joe (Society for American Archaeology) - Criado-Boado, Felipe (European Association of Archaeologists)

**Abstract format:** Oral

Archaeology, as the study of the human condition from earliest times to the present, has a unique potential to inform on current global societal and environmental conditions. As a strategy and adaptive response, migration has had often profound impacts on human societies for millennia and has been a focus of study since archaeology emerged as a scientific discipline. The sheer quantity of information that has been accumulated as the result of academic and heritage management archaeological projects should be an obvious source for policy makers to turn to in order to better understand contemporary societal issues through the lessons of the past regarding migration. However, the synthesis of these data and their application to modern “issues” are challenging tasks. Using information from representatives of professional archaeological societies from around the world, this paper explores the role of these societies and their capacities and commitments for encouraging and disseminating synthetic work on all aspects of migration, whether it be on local, regional, continental, or global scales.

84 **ISLAMICATE ARCHAEOLOGY IN EUROPE. THE ELEPHANT IN THE ROOM**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Shingiray, Irina (Oxford University) - Koval, Vladimir - Belyaev, Leonid (Russian Academy of Sciences)

**Format:** Regular session

In three successive years (EAA annual meetings in Maastricht, Barcelona and Bern), we have been presenting how the traditional historical and archaeological approaches to the presence of Islamicate societies in European history has been dominated by a narrative of exception and interruption. The time is ripe for taking this discussion forward, exploring what theoretical avenues can contribute to providing a more nuanced and richer perspective of Europe’s Islamicate pasts. Is colonial theory one of the keys for a more balanced understanding of post-Islamicate societies, for instance in Iberia and Sicily? How can we address archaeologically the presence of significant crypto-Islamic groups in Christian-dominated areas? To what extent has past Islamicate presence and its archaeological representation contributed to some areas of Europe being perceived as peripheral, in contrast to other regions which never witnessed any significant Islamic presence? What is the best way to promote an understanding of Islamicate heritage in Europe that appeals to the “us” and not to the “them”?

To a large extent, past Islamicate societies are the elephant in the room in many regional European archaeologies, and merely rejecting the narrative of exception and interruption is no longer enough. This session aims to explore constructive ways to continue the discussion, bringing forward a new understanding about Islamicate archaeologies in Europe.

**ABSTRACTS**

1 **IS ISLAMICATE EUROPE A THING? POKING THE ELEPHANT IN THE ROOM**

**Abstract author(s):** Carvajal Lopez, Jose (University of Leicester)

**Abstract format:** Oral

On the occasion of the fourth iteration of this three-time successful session of EAA, I will present some thoughts on the basic ideas on which the group has conveyed. For three years we have discussed a range of issues, from colonialism in Islamicate archaeology to themes of centre and periphery of places with an Islamic past, passing by a multitude of regional and general issues all over the Islamic heritage of Europe. While this has enriched substantially our knowledge, I think that to a certain extent it has blinded us to other questions that need to be asked.

One of them would be for me the idea of an Islamicate Europe, that is, the convenience to focus on Europe as an unit of analysis for anything Islamic. The concept of an Islamicate (or Islamic) Archaeology of Europe may be justified from the point of view of regional heritage (and thus it is in itself a concept composed of the European regions). However, the idea of Europe as something significant in terms of the history of Islam does not seem very robust, given that the idea and territory of Europe was formed much after the territorial entity of Islam. In other words, using the expression ‘Islamicate Europe’ seems to be a way to ‘colonize’ Islam by distinguishing its European parts.

In this paper I aim to explore this question and to offer some points of discussion to stimulate debate.

2 ISLAMICATE ARCHAEOLOGY OF THE STEPPE NOMADS: THE ELEPHANT IN THE ROOM OR THE ZONE OF SILENCE?

**Abstract author(s):** Shingiray, Irina (University of Oxford)

**Abstract format:** Oral

In the past three sessions we have discussed Islamicate Archaeology in different regions of geographic Europe and beyond and among different cultural groups and communities. We talked about nationalisms, politics, academic practices, and strategies that impact archaeological investigation of Islamicate societies in Europe and promote or hinder the integration of this knowledge into mainstream historical discourse. We also highlighted the unique role of archaeology in elucidating the Islamicate past in a way that can be much more complex, nuanced, and revealing than that offered by historical sources, narratives, assumptions, and clichés. In this session, we will continue addressing this topic from a theoretical perspective—my contribution will focus on archaeological and historical narratives and perceptions of the medieval Islamicate nomads of the Western Eurasian Steppe. I will explore various clichés regarding the spread and practices of Islam among the steppe nomads and the way the fields of archaeology and history approach them. I will discuss such concepts as “otherness,” “backwardness,” “religious vestiges,” and the nomadic “yoke” and “bulwark” in relation to those people, and discuss how this treatment of those Steppe communities and their beliefs allows many scholars to sweep nomadic Islam under the rug, producing a zone of religious silence in nationalist and Eurocentric historical narratives. However, the archaeological reexamination and reinterpretation of nomadic material culture has the power to break that silence.

3 THE COINS THAT TRANSFORMED EURASIA: ISLAMICATE HERITAGE IN ITINERANT ASSEMBLAGES

**Abstract author(s):** Knutson, Sara (University of California Berkeley)

**Abstract format:** Oral

This paper observes that when archaeologists take for granted traditional paradigms of social identity without recognizing their roots in dominant white European narratives and knowledge practices, the result is blind spots in our understanding of human mobilities and cross-cultural interactions. As a case study, I discuss the long-distance social relations between the Islamic Umayyad, Fatimid, and Abbasid Caliphates and medieval European communities based on archaeological and numismatic evidence. The social activity that brought these groups to form enduring interactions and expansive networks that stretched across Eurasia left extensive material traces, including mobile Islamic coinage which moved throughout the Eurasian seaways and Eastern European river routes. I argue that a network approach to these cross-cultural interactions in the archaeological record offers a powerful way of destabilizing “center-periphery” narratives of Islamicate heritage and in doing so, archaeologists are able to better articulate the mobility of humans and materials as an intrinsically social process.

4 VIKING HINTERLANDS OF THE ‘ABBĀSID ISLAMICATE WORLD

**Abstract author(s):** Delvaux, Matthew (Boston College)

**Abstract format:** Oral

Viking-Age Europe, ca. 800–1050 CE, exemplifies how, along the peripheries of the medieval Islamicate world, the Islamicate world could still be central. Men eagerly acquired goods from the Caliphate, and women wore them to their graves. Archaeologists have long looked to Scandinavian hoards to study silver production in the Islamicate world, but typological and now chemical analysis point to other connections as well. Stone and especially glass flowed north into the Viking world—sometimes corresponding to and sometimes varying from patterns seen along routes into the other hinterlands of the ‘Abbāsīd Islamicate world. What do these things tell us about the Islamicate world? What challenges does this perspective introduce to the study of the Viking Age?

In this paper, I present evidence that connections to the Islamicate world shaped the emergence of the Viking Age. Key developments—the growth of maritime communities, the advent of raiding, the adoption of new forms of material culture, the stratification of society—were all conditioned by a desire to access wealth from the Islamicate world. This archaeological evidence challenges nationalist and isolationist narratives of an autochthonous Viking Age, while also challenging scholars to present viking violence as conditioned but not caused by developments in the Islamicate world.

5 MUSLIM NEWCOMERS AND DWELLERS THROUGH THE AL-QARYA OF VALL D'UIXÓ (CASTELLÓ, EASTERN SPAIN)

**Abstract author(s):** Olivé-Busom, Júlia (Autonomous University of Barcelona)

**Abstract format:** Oral

Despite a lively historiographic debate focused on the new population structures and movements that both the Islamic conquest of the 8th century and the posterior Feudal conquest of the 13th century caused in Šarq al-Andalus, the osteological registry remains mainly unexplored. This lack of research is not caused by a lack of materials, as plenty Islamic cemeteries have been excavated.

Here the osteological population from one of the qarya around the fortress of Šūn (Vall d'Uixó) is addressed. These settlements began forming around the 9th to 10th centuries and were part of the new social, political and agrarian order that the Islamic conquest had brought. The conquest resulted in the arrival of new migrant population hailing from Northern Africa and the Arabic Peninsula. Šarq al-Andalus is characterised by a dense toponymy of Berber and Arabic origin. Meanwhile, the region immediately to its north, the Superior Border, seems to have maintained a predominantly indigenous population. After the Feudal conquest, historical written

sources suggest that the northern regions were repopulated with Christians, whilst in the south of the Ebro river a portion of the old Muslim population remained.

The amount of both Muslim settlers that arrived in the Iberian Peninsula and that remained there after the Feudal conquest is still being debated, as well as the terms under which their settlement was made and the influence that the Umayyad state and Islam had on the indigenous population. Through the integration of both the current knowledge yielded by funerary archaeology and textual sources, and the new data obtained through physical anthropology, we aim to update our current knowledge on the Islamic communities of Šarq al-Andalus and how they compare to those from the Superior Border. In addition, we intend to present the possibilities that analytical techniques bring to the current academic debate.

6 RECENT INVESTIGATIONS AT MADINAT ILBIRA, ONE OF THE EARLY ISLAMIC TOWNS IN AL-ANDALUS

**Abstract author(s):** Garcia-Contreras Ruiz, Guillermo (Universidad de Granada) - Rebkowski, Marian (Institute of Archaeology and Ethnology - Polish Academy of Science) - Malpica Cuello, Antonio (Universidad de Granada) - Herbich, Tomasz (Institute of Archaeology and Ethnology - Polish Academy of Science) - Martínez Álvarez, Cristina (Universidad de Granada) - Filipowiak, Wojciech - Kokora, Karolina (Institute of Archaeology and Ethnology - Polish Academy of Science)

**Abstract format:** Oral

This paper is the result of the first seasons of research conducted as part of a new project at Madīnat Ilbīra, funded by the Polish National Science Centre in collaboration with the University of Granada (Spain). The paper presents the results of non-invasive investigations conducted at the archaeological site of Madīnat Ilbīra – a medieval town located in the centre of the plain of Granada and the capital of one of the kūras of al-Andalus. Three methods were applied during the survey: terrestrial laser scanning (TLS), electrical resistance (profiling) and magnetometry. Altogether, the survey covered an area greater than 30 ha. At the same time, the paper presents the main contributions of the two seasons of excavation, with a total of 4 new trenches, conducted in new areas of the town where the quantity and quality of the new research producing important data concerning the presumed location of a citadel, as well the extent of the urban space,, the organization of houses and streets into the quarters or the material culture from early 9th to mid 11th centuries.

7 SAN ESTEBAN ARCHAEOLOGICAL SITE: NEW INSIGHTS ABOUT THE ISLAMIC ANDALUSIAN URBANISM IN MADINAT MURSIYĀ (SPAIN)

**Abstract author(s):** Eiroa, Jorge (Departamento de Prehistoria, Arqueología, Universidad de Murcia) - González, Jose - Haber, María - Hernández, Alicia - Celma, Mireia - Molina, Isabel - Muñoz, María - Martínez Rodríguez, Antonio - Salas, Sergio - Gómez, Javier (University of Murcia)

**Abstract format:** Oral

The “San Esteban Archaeological site” research project (<http://sanesteban.um.es/>) is developing an interdisciplinary study of the Arrixaca arrabal, partially unearthed in the northwestern area of the Andalusian city of Madinat Mursiyā (12th-13th centuries) outside the limits of the first medieval walls. The dig of this area displayed a populated urban neighbourhood with a preserved underground drainage system. Regarding the areas of excavation, a big private property and a huge complex interpreted as a ‘funduq’ have been identified, which proves the economic importance of this ‘arrabal’. On its west side, there is a sophisticated industrial area with many interdependent rooms that are being researched. In the limit of the site, we found a ‘maqbara’, an Islamic cemetery, where more than 30 burials have been studied, and some structures related to it, such as the oratory and the mourning ritual area. The principal aim of this project is to examine the remains of the archaeological site with

the most recent archaeological techniques to understand the daily life in the city of Murcia during the Middle Ages (12th-13th centuries cal AD). The first bioarchaeological results obtained through organic residue analysis, zooarchaeology, palaeoparasitology, palynology, carpology, anthracology, DNA, and isotope analysis, are being compared with the information provided by the written sources. Thus, we expect a more precise understanding of the urban neighbourhoods planned outside the first walls of the medieval Islamic cities and the reasons they were created. This project is being developed in collaboration between the University of Murcia and The City Council of Murcia.

8 MERCHANTS, NOMADS, PILGRIMS: THEIR ROLES IN THE TRADE OF SUAKIN, SUDAN

**Abstract author(s):** Smith, Laurence - Taha, Shadia (McDonald Institute, University of Cambridge; Wolfson College, University of Cambridge) - Phillips, Jacke (SOAS, University of London; McDonald Institute, University of Cambridge) - Mallinson, Michael (Mallinson Architects and Engineers, London)

**Abstract format:** Oral

The paper will consider links between the African Red Sea coast and the regions of the Arabian Peninsula and Asia, concentrating on south-west Asia, based on the Sudanese former port of Suakin Island during the Ottoman period (c. early 16th to mid-19th centuries AD), based recent fieldwork and records. We will focus specifically on work in progress on items traded overland from the hinterland of Suakin and by sea. Archaeological, historic and ethnographic evidence will be used to consider the following questions:

- Evidence for the source or sources of the origin of these items.
- How such material moved from the place of origin to Suakin, concentrating on the role(s) of merchants, nomads and pilgrims



- The land and sea routes involved, and means of transport
- Ethnographic evidence about the communities of traders at Suakin and commodities traded, including those from the port’s hinterland.

Archaeological evidence will focus on pottery recovered at Suakin dating from the Ottoman period that can be provenanced to one or a restricted range of regions stylistically, Secondary historical evidence will be based on Arabic historical and geographic sources and on early European accounts, while the ethnographic evidence will be based on interviews with descendants of the families formerly living at Suakin Island town.

## 9 ISLAMIZATION AT THE URBAN SITE OF TATARTUP AND ZMEISKY BURIAL GROUND, NORTH OSSETIA-ALANIA IN THE NORTH CAUCASUS

**Abstract author(s):** Leontyeva, Anna (The Institute of Archaeology of the Russian Academy of Sciences)

**Abstract format:** Oral

This paper will address archaeological evidence of the Islamization of some groups of the medieval Alans in the Northern Caucasus during the Golden Horde period (13th-14th centuries). This evidence comes from an archeological complex that includes the urban site of Tatartup (Upper Dzholat) and the nearby Zmeisky burial ground—both located at the “Elkhotovo Gates” in the Republic of North Ossetia-Alania.

During the period of 1957-1960, archaeologists V.A. Kuznetsov and O.V. Miloradovich excavated Tatartup and discovered three minarets and two mosques: the main city-mosque and a smaller one. The famous Tatartup minaret was unfortunately destroyed in 1981 as a result of an unsuccessful restoration attempt. During the excavations of the city-mosque, two burials were found underneath its floor and eight graves around the building. All interments contained no grave goods. People were buried with their heads to the west and facing south.

In 1993, R.F. Fidarov investigated three Muslim graves constructed with brick and stone at Zmeisky burial ground. More recent excavations there (led by M.A. Bakushev) unearthed a large amount of new burials, the majority of which were pit graves, but which also contained 119 catacomb graves usually attributed to the Alans. Overall 86 Muslim burials have been identified there. The dead were buried with their heads to the west and with their faces oriented to the south. Most burials were without grave goods.

Thus, it becomes evident that some of the Alans who resided at Tatartup and buried their dead at Zmeisky burial ground were converting to Islam most likely under the influence of the Golden Horde—the major Muslim power in the region at that time. Moreover, due to the location of Tatartup at the nexus of major trade-routes, the important role of Muslim merchants in the Islamization of the Alans should also be considered.

## 10 BAZAAR ARCHITECTURE IN THE 14TH CENTURY ISLAMIC CITY OF BOLGAR

**Abstract author(s):** Koval, Vladimir (Institute of Archaeology RAS)

**Abstract format:** Oral

The city of Bolgar was the capital of the Islamic (adopted in 922) state Volga Bulgaria, which became the part of the Genghis Khan Empire in the 13th century and later – the Golden Horde, who adopted Islam in the 14th century. The bazaar building was constructed in the city center, near the cathedral mosque. Both the layout, dimensions (with the side of the square over 30 m), and the architectural features of these two buildings were very similar. Their walls with a thickness of about 1 m could not withstand stone arches, so the roof of these buildings rested on many stone columns (mosque) or wooden pillars (bazaar). A similar construction technique is known in Central Asia, for example, in the cathedral mosque of the city of Kayalyk (now the hillfort in the southeastern part of Kazakhstan).

Probably, the construction of the bazaar and mosque was carried out on the basis of the traditions of Central Asian architecture, i.e. countries of Islam. This is also indicated by the use of adobe bricks for the construction of the internal partitions of the bazaar (such bricks have never been used in Bolgar before, because the humid climate of the center of Eastern Europe did not contribute to its successful using). The buildings of the 14th century bazaars in Islamic countries are not been studied by archaeologists. It is also possible that masters from Transcaucasia or Asia Minor took part in the construction of Bolgar’s bazaar. Some finds of imported glazed ceramics and architectural features of other stone buildings of Bolgar (baths of the eastern type and mausoleums) indicate this direction of relations.

## 11 ISLAMIC ARCHAEOLOGY IN UKRAINE: LEVELS OF PERCEPTION AND INVESTIGATION

**Abstract author(s):** Biliaieva, Svitlana (Institute of Archaeology of National Academy of Sciences of Ukraine)

**Abstract format:** Oral

Islamic archaeology presents an important part of the modern investigations in Ukraine. It spans the long period of history: from medieval to present time. In the territorial borders of the Ukrainian lands, the Islamic presence differs in its extent from other territories and populations of Ukraine. Meanwhile, the North Black Sea area, due to its geographical position, landscape, and great possibilities for mobility and trade roots, has an inclusive role in the development of Islamic communities and in contacts with other peoples, including the Christians. In the past, scholarly perception of Islam acquired, presumably, a negative attitude, which overall affected the purposeful excavation of archaeological monuments of Islamic culture beginning in the last decades of the XX century.

Some difficulties in understanding of the essence of Islamic cultures, presented by ideological symbols and mentality, and the interconnections, influences, incorporations and co-existence of Islamic and Christians population, were recognized in the result of archaeological investigations. These interconnections present an important phenomenon in the historical development of Eastern Europe. The major focus of the current investigations includes a wide range of monuments of Islamic archaeology of the end of the first millennium A.D. (Seljuk, Golden Horde and Ottoman periods), as well as the archaeology of the modern Islamic population of Ukraine.

## 12 THE FORMATION AND DISAPPEARANCE OF AN ISLAMIC CULTURE IN HUNGARY 150 YEARS UNDER/ CLOSE TO OTTOMAN RULE (1541-1699)

**Abstract author(s):** Papp, Adrienn (Pázmány Péter Catholic University; Budapest History Museum)

**Abstract format:** Oral

The Ottoman Conquest in the middle of the 16th century led to a very new and complex situation in the Hungarian Kingdom. One third of the medieval kingdom was occupied by Ottomans until the middle of the 16th century, the second third became a vassal state of the Ottomans, and the rest of the kingdom was integrated into the Habsburg Empire. The situation became even more complex regarding the occupied part, where Ottomans tended to live only in fortified castles and the indigenous (mostly Hungarian) inhabitants preferred to live in the countryside.

In my presentation I would like to focus on the differences and similarities in the archaeological heritage of the abovementioned three regions of the kingdom. The old connections survived in the territory of the Medieval Hungarian Kingdom, hence leading to many continuous elements, but at the same time, totally new types of artefacts and buildings appeared. Some more interesting phenomena characterize Transylvania, the vassal state of the Ottoman Empire. The princesses of this state started to follow the Ottoman mode in some cases but without conversion to Islam itself.

## 13 LIFE ON THE MUSLIM-CHRISTIAN FRONTIERS IN EARLY MODERN HUNGARY

**Abstract author(s):** Mordovin, Maxim (Eötvös Loránd University)

**Abstract format:** Oral

The turbulent epoch of the Ottoman wars in Hungary (16th-17th centuries) is mostly considered as a time of permanent horror and a sequence of national catastrophes. However, the reality is much more different. The conquest of the capital and the central part of the Kingdom of Hungary by the second half of the 16th century resulted in the establishment of a more-or-less stable border zone. Many formerly unimportant smaller towns profited from this situation becoming centres of trade and craftsmanship. In this paper, I will introduce the results of several longer excavations took place in three such towns and evaluate the archaeological traces of the Christian and Muslim coexistence during the time of permanent military conflict. The presence of the new population is traceable in three different features. The most important - and the most spectacular - is architecture, both military and domestic. The Ottoman military constructed specific ramparts in all three discussed sites. The material culture also shows significant changes in traditions and in introducing new pottery types. The partly surviving local ceramic traditions were adjusted to the new demands displaying previously unknown pottery shapes. The border zone character of these towns made them prosperous and economically successful settlements with a multicultural population. As the conflict period ended, the military personnel left the towns and the prosperity had also gone, and none of these places has reached this stage of wealth and importance ever since.

## 14 ORIENT FROM THE WEST: THE MOSCOW TILES ORIGIN

**Abstract author(s):** Belyaev, Leonid (Institute of Archaeology Russian Academy of Sciences) - Baranova, Svetlana (Russian State University for Humanities)

**Abstract format:** Oral

Moscow potters of the 17th c. were masters of tile decoration. Their products did embellish the facades and the items of interior, especially stoves. The general feature of the early Moscow tiles was the low relief ornamentation. Its surface could be a variety of coating: simple red or white clay, transparent greenish glaze, and, starting from the 1650-s, blind polychrome enamel. For the art-historians of the 19th c. tiles have long been an important icon of Moscow culture before Peter the Great transformation. However, the origin of them remained unclear. Their oriental genesis seemed more likely. Firstly, the late Islamic architecture willingly used tile as the basic element of the facade. Secondly, Moscow had the close contacts with the Islamic world of the 14th-17th cc. The last but not the least, the ornaments of the Moscow tiles and of the carved stone decoration were evidently oriental. It was a common place of the Russian literature of the mid 19th c. to mention a tile as one of the oriental elements. Concurrently the different position was announced, that the tiles were brought to Moscow by the architects from Italy and, later on, from the Central Europe. The prominent artists and historians of technology took part in the discussion. At the early 20th c. it was proved that the recipe of Moscow glazed and enamel tiles, and their forms, are totally Western. The oriental decorative elements were the results of the early European Orientalism but not of the Islamic pottery production influence. This model of the transfer of “the Orient “ in reverse, from Europe to Russia, has a general character and is typical for the Early Modern time Moscow culture.



TURKISH CULTURE AND ITS INFLUENCE ON ORNAMENTAL MOTIFS ON UKRAINIAN RELIEF TILES OF THE XVI-XVII CENTURIES

**Abstract author(s):** Vynogradska, Larysa (Institute of Archaeology of the National Academy of Science of Ukraine)

**Abstract format:** Oral

In the XVI-XVII centuries, the European passion for Turkish culture led to the use in everyday life of a wide range of products (clothing, dishes, fabrics, jewelry) of oriental origin with ornamental motifs common in Islamic art (arabesques, pomegranate fruit, scaly ornament, rosettes, acanthus and palmettes). Most often, these motives penetrated into Ukraine through the sale of objects of art, fabrics, carpets, as well as through military operations of the Cossacks against the Tatars and Ottomans and raids on their trade caravans. The goods acquired by the Cossacks in this way diverged from the Ukrainian settlements and farms. Elements of oriental motifs, borrowed from ornaments on fabrics, carpets, ceramic products, decorations, were processed by local craftsmen, simplified according to the aesthetic needs of the customer and the professional qualities of the craftsman. They often received a synthesis of elements of eastern and western motifs. So, during twentieth-century excavations in Belgorod-Dniester, some furnace tiles were found, which relief ornament combined the design features of Western European tiles with the traditional Islamic talismanic symbols. The main elements of oriental motifs in Ukrainian tiles were krin, scaly ornament, palmettes, rosettes and acanthus. Sometimes there are city landscapes with minarets and elephant riders. From the second half of the seventeenth century, we find the spread of carpet ornament and vase motif with flowers. Thus, oriental ornamental motifs on Ukrainian tiles are most common in the Ottoman period.

a. FEATURES OF THE ISLAMIC GLASS FROM THE GOLDEN HORDE

**Abstract author(s):** Valiulina, Svetlana (Kazan Federal University)

**Abstract format:** Poster

First of all, it should be noted that Islamic glass, which is one of the most eminent components of Islamic production, art, and Islamic archeology, has never been an "Elephant in the Room" for Europe. Having appeared in the early Middle Ages on the basis of traditions of two schools – Byzantine and Sassanian, the glass-making in Islamic countries demonstrates the continuity of the tradition in the technology, forms and decoration of certain types of vessels and jewelry for centuries from Roman times to the late Middle Ages. In the Mamluk period Islamic glass served as a raw material and inspiration for the appearance of Venetian glass. Regarding the reception of antiquity in Islamic glass making, one should consider a method of manufacturing glass products in the "sandwich" technique - interglass gilding – described by Theophilus Presbyter. Europeans began to study this "not an Elephant" long ago (from the end of the 19th - beginning of the 20th c.) and carefully (G. Schmoranz, K. Lamm). Currently, there is a rich historiography on this issue. In the 13th-14th centuries, the area of distribution of Islamic culture including Islamic glass in the vast territory of Eurasia was the state of the Golden Horde. With the amazing unity of the rapidly developing syncretic culture of the Golden Horde, glass, which was imported from the Middle East and Central Asia, and the products of local workshops from the capital city of Saray and Bolgar, had their own characteristic features. An integrated approach based on stratigraphy data and the archaeological context, using the methods of Archaeometry, allow us to study and explain this regional specificity and determine the place of Islamic glass of the Golden Horde in Medieval glass making.

The study was supported by the Russian Foundation for Basic Research, grant no.18-09-00316A.

b. OTTOMAN ARCHAEOLOGY IN FORMER KÜSTENDJE (CONSTANȚA, ROMANIA)

**Abstract author(s):** Mototolea, Aurel - Potârniche, Tiberiu (Museum of National History and Archaeology Constanța) - Stanc, Margareta (Faculty of Biology, Alexandru Ioan Cuza University of Iași)

**Abstract format:** Poster

In recent years (2016-2018), preventive archaeological research conducted in the perimeter of the old Ottoman city (Küstendje) led to the discovery of structures of habitation, as well as of numerous artifacts of Ottoman period (pottery, coins, buckles etc.).

Research done in the summer of 2017, behind the "Carol I" mosque (built in 1910 on the site of the former mosque used in the 19th century) has shown that in the range between the current level of the terrain and the -1.5 m depth, Ottoman period materials appeared constantly. We note the structure of a large building, that could not be fully investigated. Parallel to this wall, there was a transversally brick-lined drainage channel. This channel is poured into a tank (hazna). This type of hazna is commonly found in Constanța for the pre-modern period, due to the lack of a sewage system. Archaeological materials discovered in 2017 consist mainly of ceramics, debris, and various scraps of iron objects. A small (probably) Persian cup of the 17th century is the proof of commercial routes passing through Constanța during that period. A similar structure, probably a fountain, was discovered in 2016 in another part of the former Ottoman city.

Also we can mention the discovery, in the year 2016, on the occasion of underwater research carried out by specialists of the department of the Constanța Museum, a Turkish oil lamp (17th - beginning of the 18th century), among other objects of a sunken ship.

The archaeological pieces, in a fragmentary or integral state, found in research campaigns 2016-2018, are undergoing processing or restoration, leaving out all the available information, and establishing exact analogies.

These discoveries bring new data to the knowledge of daily life during the Ottoman administration in the former Küstendje, a locality on the periphery of the Islamic world.

DISENTANGLING INEQUALITY AND ITS MECHANISMS IN LATE PREHISTORIC EUROPE THROUGH ISOTOPE ANALYSIS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Fernandez-Crespo, Teresa (CNRS, LAMPEA - UMR 7269) - Díaz-Zorita Bonilla, Marta (Tübingen Universität)

**Format:** Regular session

Identifying and understanding the rationale and the mechanisms behind inequality in Prehistory is a major challenge in archaeological research. The transition from hunting and gathering to farming and herding economies has long been linked to the emergence of substantial and long-lasting social and economic inequalities. However, the European record rarely shows robust archaeological evidence for horizontal (among individuals or households) and/or vertical (among culturally defined groups) inequalities until, at least, the 2nd millennium cal. BC.

As status, especially in early societies, is intimately associated to subsistence and origin (i.e. people are basically what they eat, with whom they eat, how they eat, and where they get their food or come from). Therefore, isotope analysis may shed light on the socio-economic standing and identity of past individuals and groups. This session will explore the potential of multi-isotope analysis for revealing the sources and the mechanisms of asymmetry in prehistoric Europe and, so, for gaining insights into social complexity, power, status, competition and cooperation.

Submissions aiming reconstructions of dietary and mobility patterns within multi-cultural societies are especially welcome, as well as studies combining isotopic, bioarchaeological and genetic data to look into population dynamics and differentiation at regional centers of aggregated population. Contributions presenting evidence for Neolithic socio-economic inequality are particularly encouraged. Reports of negative results are also welcome.

ABSTRACTS

1 ISOTOPES AND IVORY? POSSIBILITIES AND LIMITATIONS FOR CONSERVATION OF IVORY FROM ARCHAEOLOGICAL RECORD

**Abstract author(s):** Lucíañez Triviño, Miriam (University of the Basque Country - UPV/EHU; Eberhard-Karls-Universität Tübingen) - Díaz-Zorita Bonilla, Marta (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters; SFB 1070 RessourcenKulturen)

**Abstract format:** Oral

The value of different raw materials have changed throughout History, and it depends on the cultural values of the society that consumes them. However, it seems that ivory has always enjoyed great value in the social and cultural spheres since the Palaeolithic.

Ivory was used during the Iberian Copper Age in funerary contexts, and this was interpreted as an expression of wealth. This can be found in different contexts in southern Spain but also in Portugal. Particularly in the Guadalquivir valley at the Chalcolithic site of Valencina-Castilleja (Seville, Spain). At this site, almost 8.8 kg of ivory were discovered in different sectors. They were mainly documented in funerary contexts, but some small fragments have been also excavated in non-funerary contexts.

Our current project (recently started) aims to verify the potential and limitations of various analytical techniques, including the analysis of stable isotopes of carbon and nitrogen ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) applied to ivory, with the main focus for its conservation (diagnosis).

In this paper we will present the intra-site results of the elemental (%C, %N and %S) and isotopic analysis of Valencina-Castilleja ivories. The elemental analyses prior to collagen extraction for isotopes, is presented as an important multidisciplinary tool in the methodology for studying ivories. It requires a very small amount of sample and offers data on the quality of collagen, which allow us to check the intra-site differential conservation and better understanding of the degradation processes of ivory.

2 INEQUALITY AND SOCIAL DIFFERENCES IN THE BRONZE AGE SITE OF COBRE LAS CRUCES (SEVILLE, SPAIN)

**Abstract author(s):** Chala-Aldana, Döbereiner - Diaz-Zorita Bonilla, Marta - Bartelheim, Martin (SFB 1070 RessourcenKulturen, Eberhard Karls Universität Tübingen; Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhard Karls Universität Tübingen)

**Abstract format:** Oral

Several climatic and intra-group phenomena during the Bronze Age presumably caused drastic changes in social and cultural practices among human groups in the south of the Iberian Peninsula. We observe those changes within one of the most significant parts of the archaeological record: funerary practices. Individual funerary structures, mainly pit burials, cists, and burial niches (depending on the region), replaced megalithic structures with collective burials. In the Middle Guadalquivir valley, some isolated inhumations were found as well as cist necropolises with individual burials. The appearance of individual burials at the beginning of the Bronze Age goes along with a change in the way of life from settling and interacting in large open spaces at the end of the Copper Age to living in smaller and very well-defended areas in higher altitudes with difficult access during the Bronze Age.

This paper presents the results of the analysis of burials in the necropolis of Cobre Las Cruces (Salteras, Seville, Spain). The analysis of the funerary architecture, ceramics, radiocarbon dating, and isotope analysis revealed some of the main characteristics of the

diet, the use of resources, and the social perception of death. These three elements contribute significantly to our knowledge about social and cultural changes that occurred at the transition between the 3rd and 2nd millennia, especially regarding inequalities and social relationships beyond kinship.

3 **ISOTOPIC ANALYSIS OF DIET AND MOBILITY FROM HUMAN REMAINS BETWEEN THE CHALCOLITHIC AND IRON AGE IN SOUTH PORTUGAL**

**Abstract author(s):** Melo, Linda (Foundation for Science and Technology - FCT-SFRH/BD/130165/2017. Laboratory of Prehistory, Research Center in Anthropology and Health - CIAS, Department of Life Sciences, University of Coimbra) - Bonilla, Marta (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Tübingen Universität) - Silva, Ana (Laboratory of Prehistory. Research Center in Anthropology and Health - CIAS, Department of Life Sciences, University of Coimbra). UNIARQ-WAPS, University of Lisbon)

**Abstract format:** Oral

The present study aims to deepen the knowledge of human populations that died in the region of Beja (South of Portugal) between the Chalcolithic and Iron Age. This study is based on an interdisciplinary methodological approach combining anthropological, archaeological and biochemical data to obtain a deeper understanding of these human communities. Although diet and mobility could be inferred by material culture, among others ways, our goal is to use the stable isotope analyses of human remains. The purpose is to examine strontium, oxygen, nitrogen and carbon isotope ratios ( $^{87}\text{Sr}/^{86}\text{Sr}$ ,  $\delta^{18}\text{O}$ ;  $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}$ ) in dental enamel and bone collagen respectively from  $n = 82$  samples (70 human and 13 faunal remains). Stable isotope analyses will allow us to draw inferences about their diet, and so address many questions, among others, the social distinction (age, sex or status) and mobility patterns within and between these communities during 2500 years in a particular geographic area of Portugal (Baixo Alentejo, Portuguese Inland).

4 **USING FAUNAL  $\delta^{15}\text{N}$  COMPOSITIONS TO DISTINGUISH BETWEEN DIFFERENT SOCIAL GROUPS AT EARLY IRON AGE ZAGORA, ANDROS, GREECE**

**Abstract author(s):** Alagich, Rudolph (University of Sydney) - Smith, Colin (La Trobe University; Universidad de Burgos)

**Abstract format:** Oral

The  $\delta^{15}\text{N}$  composition of plants is suggestive of the conditions under which they developed. Elevated  $\delta^{15}\text{N}$  compositions can indicate a greater concentration of soil organic matter, which can be the result of anthropogenic factors such as the intentional application of manure by farmers or through incidental deposition by domestic animals. Both scenarios hint at restricted agricultural land: when cultivable land is limited, farmers may apply more manure to the soil to increase its productivity and animals grazing in confined areas will deposit a greater concentration of manure and urine than in open areas. Furthermore, soil within and close to settlements would have a higher  $\delta^{15}\text{N}$  composition due to the disposal of organic refuse.

Isotope analyses of caprine bone collagen from Early Iron Age Zagora (ca. 900-700 BCE) have revealed a difference in  $\delta^{15}\text{N}$  composition between two of the three main excavated areas, D and J, with the J area producing caprines with the highest  $\delta^{15}\text{N}$  compositions. The houses in the J area, which were established relatively late in the settlement's occupation period, have a smaller mean size than those in the D area and household storage space in J is also smaller.

Attributes such as house size and household storage capacity (with the latter considered a proxy for agricultural wealth) have been used by archaeologists to identify different socio-economic groups within small-scale societies. The isotopic results from Zagora therefore suggest that the D and J areas may have been occupied by different social groups. The picture is clouded, however, by the presence of prominent architecture in the J area which has yet to produce faunal samples for isotopic analyses, as well as ambiguous results yielded in the third main area to be excavated (H), one of the most prominent in town by the sacred precinct.

5 **USING A MULTI-ISOTOPIC APPROACH FOR EXPLORING MOBILITY AND SOCIETY IN IRON AGE BRITAIN**

**Abstract author(s):** Hamilton, Derek (SUERC, University of Glasgow)

**Abstract format:** Oral

Archaeologists have long used the form, style, and patterning of material remains to infer such things as social, economic, and political structures of past societies. In doing so, they reconstruct the complex inter- and intra-group connections of a society, which for communities in Iron Age Britain – especially in the Middle Iron Age (c. 400–200 cal BC) – have often been characterised as bounded and local. This paper moves beyond the form and style of the material remains and uses scientific data gleaned directly from the remains of people and animals from sites across Iron Age Wessex to challenge this notion of an almost parochial society actively avoiding contact with outside groups.

A multi-isotopic approach ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{34}\text{S}$ ,  $\delta^{18}\text{O}$ , and  $^{87}\text{Sr}/^{86}\text{Sr}$ ) has been employed to infer population mobility for both the inhumed human populations and the faunal assemblages from associated settlements. A traditional 'population' approach allows investigating broad questions of human and animal movement, such as to what degree were livestock transported across the landscape? Additionally, a 'differential' approach (i.e. looking at the changes in the isotopic ratios in an individual through time) can help reconstruct the movements of individuals within the population and approach questions about individual mobility, social differentiation, and the treatment of the individual in death. The combination of these two approaches in a single research strategy, thus produces data at multiple scales that allow us to develop a robust narrative of the society.

6 **ENVIRONMENTAL CHANGES IN LA GOMERA (CANARY ISLANDS, SPAIN) THROUGH THE III-XV CENTURIES AD: NEW INSIGHTS FROM STABLE ISOTOPE ANALYSES**

**Abstract author(s):** Cañadillas, Elías (University of La Laguna)

**Abstract format:** Oral

Stable Isotope analysis can be used as an indicator for life conditions in the past. While both carbon and nitrogen have been widely used as dietary indicators, they can also provide valuable information about the environment of the past and how it changed during certain periods, whether it was due to human activity or to natural processes. This is especially remarkable in insular contexts, where the population was mainly isolated and had to recur to a limited range of resources. The island of La Gomera, located in the Atlantic Ocean, was inhabited by an aboriginal population of North African origin from at least the third century AD up to the fifteenth century AD. The archaeological record points towards a mainly shepherding society, but to this point, few research have been made about possible climatic changes which could have led to transformations in the livelihood of this society. Consequently, in this study we present new isotopic and radiocarbon information of 33 human samples and 19 goat samples from La Gomera, belonging to different archaeological areas around the island. Our main goal is to see how carbon and nitrogen values of this human population, and possibly their main economic resources, changed across time, and to provide hypothesis that could explain these isotopic changes.

99 **FROM THE FINAL PALEOLITHIC TO THE EARLY MESOLITHIC IN EUROPE – COMPARING REGIONAL RECORDS [PAM]**

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Hussain, Shumon (Department of Archaeology and Heritage Studies, Aarhus University) - Stefański, Damian (Archaeological Museum Krakow) - Riede, Felix (Department of Archaeology and Heritage Studies, Aarhus University)

**Format:** Regular session

The transition from the Pleistocene to the Holocene is often believed to mark a caesura in human prehistory. The specific patterns and processes as well as the tempo and mode of the passage from Final Paleolithic to Mesolithic lifestyles in different European regions remain challenging to understand, however. In recent years, our knowledge of the magnitude and frequency of climate change across this period has increased dramatically, as has our awareness of leads and lags in how climate change translates into environmental change both at the regional and local scale. Yet, the degree to which technological developments parallel such climatic and attendant environmental transformations remain highly problematic. At the same time, conducting inter-regional comparative analyses is frequently hindered by the inherent complexities which characterize regional records as well as the lack of transparency in relation to the traditionally employed cultural taxonomic units. Although it is typically argued that the heterogeneous cultural topography seemingly diagnostic of the Pleistocene-Holocene transition signifies increasing regional differentiation and more and more localized forms of human behavior and adaptation, most of these claims hinge on the issue of robust systematics and comparable taxonomies. In response, this session aims (1) to collate, compare and contrast the various cultural taxonomies (e.g. techno-complexes, industries, facies and regional groups) currently deployed in European Final Paleolithic and early Mesolithic research and (2) to work towards a more source-critical and epistemologically informed synthesis of the socio-technical dynamics observable at this critical juncture in the evolution of early human societies.

We invite scholars from different backgrounds and specializations to present up-to-date, critical reviews of regional developmental sequences of culture change across the Final Paleolithic-early Mesolithic boundary, ideally including lists of key sites, diagnostic artifact classes, revised chronologies, numerical dates and paleoenvironmental proxy records.

**ABSTRACTS**

1 **INTRODUCTION: ATTEMPTING A NEW SYNTHESIS OF LITHIC VARIABILITY AND CULTURAL GEOGRAPHY AT THE FINAL PALAEO-LITHIC-EARLY MESOLITHIC INTERFACE**

**Abstract author(s):** Hussain, Shumon - Riede, Felix (Aarhus University)

**Abstract format:** Oral

Despite or perhaps precisely because of archaeology's long-standing tradition of regionally focused inquiry, syntheses across regions are rarely attempted. In part, this situation is certainly also a consequence of the sweeping growth of archaeological data and knowledge within the last few years, making it difficult for an increasingly specialized field to keep track of the rapid developments within its own borders and to foster informed data integration. A result of this retreat from broader synthetic perspectives is the concession of narratives and big histories to other disciplines, most notably palaeogenetics. Such lack of synthetic outlook, however, is not only problematic for archaeology's own role in the interdisciplinary orchestration of disciplines studying the deep human past, it also undermines substantial progress in all areas of research which utilize archaeological data – often box-ready and uncritically – to contextualize or calibrate their findings and to frame their broader research enterprise. Recurrent synthesis, in this view, is not only a welcome incubator of novel ideas and perspectives, it is also indispensable for scrutinizing long-held assumptions and the continuously re-evaluation of research concepts, categories and units of analysis.

We argue here that the Pleistocene-Holocene transition, often considered a major ecocultural threshold in earlier human evolution,



deserves renewed synthetic attention for the same reasons. With the development of new computational possibilities and the push towards Open Science, the time is now finally ripe to re-visit the empirical basis of the supposedly complex cultural geography of the Final Palaeolithic and Early Mesolithic from a pan-European perspective and to re-assess and potentially revise the attendant taken-for-granted cultural taxonomic units. Our review primarily focuses on synchronous aspects of lithic variability, but we also briefly touch upon diachronic trends that may change our apprehension of ecocultural dynamics at the Pleistocene-Holocene juncture.

2 **FIRST LITHIC CONCENTRATION IN AVOTIŅI LATE PALAEOLITHIC - EARLY MESOLITHIC SITE, CENTRAL LATVIA**

**Abstract author(s):** Kalnins, Marcis (University of Latvia, Faculty of History and Philosophy) - Rimkus, Tomas (Klaipeda University, Institute of Baltic Region History and Archaeology)

**Abstract format:** Oral

Avotiņi settlement is located on dune on the left bank of River Lielupe in Central part of Latvia. First lithic finds there – heavily patinated flint blades and flakes, were collected in 1991. Therefore, first test excavations that haven’t produced significant results, were conducted in 1993 by Ilga Zagorska. Archaeological research in site was re-established in 2018. A new flint concentration was discovered in 2018 and in 2019 it was completely explored. The flint concentration, around 8 m in diameter, consisted of 254 finds and was partly disturbed by later land cultivation. All flint finds collected during excavations are from high quality exotic Cretaceous flint. Majority of them are waste from blade and tool production. Most of formal tools are complete and fragmented leaf shape arrowheads, rest are three burins, two scrapers and one borer.

In addition to its technological attributes, lithic concentration use-wear analysis was supplemented by Olympus SZX16 stereoscopic microscope. A total of 17 artefact types were investigated, consisting of arrowheads (4), burins (3), cores (1), blades that presumably were used as knives (7), and scrapers (2). Traces of soft organic material, including meat, wood and siliceous plants, have been found on the surfaces of the majority of tools, while some artefacts show a double function, and arrowheads have remained as hunting tools.

Technological analysis of core leftovers, production waste and blades, as well as arrowhead types indicates that lithic assemblage belongs to the Swiderian technological tradition. Thus, the Avotiņi site now becomes only the second known Swiderian settlement in territory of Latvia and the oldest site in central and western part of the country. Use-wear analysis and character of the finds indicates that prehistoric hunters in Avotiņi settlement used the banks of Lielupe River to establish here a temporary hunting site.

3 **THE LATE PALAEOLITHIC IN THE NORTHERN PART OF CENTRAL POLAND**

**Abstract author(s):** Bielinska-Majewska, Beata (District Museum in Toruń, Department of Archaeology)

**Abstract format:** Oral

The first discoveries of flint products that can be linked with the Late Palaeolithic in the northern part of central Poland, that is, in the area of the basins of the lower Vistula (reaching the Gnień region) and the upper Noteć, date back to at least the end of the 19th century. Since then our knowledge and source base has increased significantly. Excavations, surface research as well as single discoveries provided many artifacts connected with the Late Palaeolithic communities in this area. The presence of archaeological sites, on which numerous flint materials were documented, mainly associated with the Tanged Point technocomplex, and, to a lesser extent, the Backed Piece technocomplex, shows that this area was characterized by environmental conditions that were of interest to the Late Palaeolithic communities. In total in the studied area, there are over 200 known archaeological sites, including the complex in Brzoza (formally Toruń-Rudak). Individual findings of flint, horn and bone objects, as well as flint material from surface studies, were also included.

The aim of this paper is to outline the current state of research and available archaeological sources left by the Palaeolithic communities in the northern part of central Poland on the example of selected archaeological sites.

4 **FINAL PALEOLITHIC AND MESOLITHIC SETTLEMENT IN WESTERN POLAND - A CASE STUDY FROM ŻUŁAWKA SITE**

**Abstract author(s):** Pyzewicz, Katarzyna (Institute of Archaeology, University of Warsaw) - Gruzdź, Witold - Migal, Witold (State Archaeological Museum in Warsaw) - Kaczor, Maciej - Teska, Sebastian (Faculty of Archaeology, Adam Mickiewicz University in Poznań) - Sobkowiak-Tabaka, Iwona (Centre for Prehistoric and Medieval Studies, Institute of Archeology and Ethnology, Polish Academy of Sciences, Poznań)

**Abstract format:** Oral

The paper presents the results of the interdisciplinary study of the remains of a multi-phase Stone Age settlement in Wielkopolska. Based on the results of analyses of the archaeological records from Żuławka, site 13, we would like to present changes that took place in the settlement from the Late Palaeolithic to the Mesolithic in western Poland. The earliest lithic artifacts from Żuławka are attributed to Swiderian culture. Mesolithic lithic artifacts are related mainly to the Komornica and post-Maglemose groups. In our studies, we mostly focused on changes associated with the two aspects - technology and utilization of lithic artifacts.

To achieve the intended effects, the methods of lithic analysis were employed, including typological, raw material sourcing, technological, use-wear, morphometric, spatial, refitting and experimental research analyses. The detailed typological analysis which mainly

covered distinctive retouched forms, provided the basis for the chronological and cultural classification of the assemblage. The raw material analysis enabled us to classified artifacts into particular categories of local flint varieties and to determine whether there was any relationship between the choice of raw material, the technology and the way individual artifacts were used. Based on the technological studies, it was possible to identify groups of artifacts produced in the course of various settlement episodes at the site. The technological research was further reinforced by the results of refitting analysis, which was applied to demonstrate the raw material processing sequence. This enabled the interpretation of both the techniques and methods of lithic reduction. Experimental studies were carried out to verify and complete the data on the technological and functional aspects. The use-wear analysis helped us verify the way Stone Age communities employed particular implements. We found out how selected groups of tools were used, what activities were undertaken with their help, and how lithic specimens were mounted.

5 **CHRONOCULTURAL DIVERSITY AT THE BRIDGE OF THE LATE PLEISTOCENE AND THE EARLY HOLOCENE IN THE KRAKÓW AREA (SOUTHERN POLAND)**

**Abstract author(s):** Stefanski, Damian (Archaeological Museum in Kraków)

**Abstract format:** Oral

The Kraków area is located in an upland zone. Together with the Carpathians, it constitutes a southern margin of the cultural processes which were distinctive for the North European Plain during the Late Pleistocene. The area is rich in finds documenting a wide spectrum of archaeological entities defined within the Allerød-Boreal time span. However, an investigation of the local chrono-cultural framework and the settlement process points to a dynamic human population there. During the Allerød and the Younger Dryas, the area appears not settled but only penetrated. A fundamental change can be noted at the beginning of the Holocene when a relatively rich and diverse Swiderian settlement appeared in the area. The investigation suggests the Palaeolithic tradition existed much longer here. It was evidenced in the latest Swiderian phase, but also in later units rooted in this tradition. A substantial transmission into the Mesolithic, though, could have taken place locally at the end of the Boreal period. This assumption is mainly based on few radiocarbon dates taken from lithic assemblages. However, other arguments like techno- and typological shift, raw material economy and spatial organisation modifications, support this hypothesis. Arguments for such reasoning will be presented and discussed.

6 **CURRENT STATE AND FUTURE OF PALAEOLITHIC RESEARCH IN ISTRIA, CROATIA**

**Abstract author(s):** Jankovic, Ivor - Novak, Mario (Institute for Anthropological Research)

**Abstract format:** Oral

Recent decade saw a rise in research on the Upper Paleolithic sites in Istria, mainly due to a number of topical projects (e.g. Palaeolithic and Mesolithic sites in the northern Adriatic” (2003-2008), and “Archaeological investigations into the Late Pleistocene and Early Holocene of the Lim Channel, Istria (ARCHAEOLIM)” (2014-2017). As a result, data on both Middle and Upper Palaeolithic of the region is ever growing. However, there is still much to learn. For example, once Neandertals were replaced by anatomically modern newcomers to Europe, the behavior of the Upper Palaeolithic hunter-gatherers was anything but static. Various archaeological traditions/industries/cultures have been recognized in different regions and at different times, some of which are still poorly understood. Furthermore, the end of the Pleistocene brought a significant rise in sea levels and changes in environmental and climatic conditions, specifically affecting the Adriatic coastline (the sea levels at the time of the Last Glacial Maximum were about 100 meters lower than today). This affected the Istrian region in particular, as it opened a natural passage (the Great Adriatic Plane) connecting it to its Italian counterpart. This paper presents an overview of the current state of investigation and outlines several research questions to explore in future work planned as a part of the new project funded by the Croatian Science Foundation (grant no. IP-2019-04-7821). Main aims are to better understand human behavior in Istria during the Upper Palaeolithic, and to compare it to adjacent regions (e.g. Italy, Dalmatia etc.) in order to see how the changes in climate and floral/faunal communities affected lifeways and contact zones of late Pleistocene hunter-gatherers. New excavations, as well as detailed analyses of already available collections through various types of analyses of both cultural and biological material will provide a much more detailed view than previously available.

7 **RE-ASSESSING THE LITHIC VARIABILITY AND CULTURAL GEOGRAPHY OF FINAL PALAEOLITHIC AND EARLY MESOLITHIC EUROPE**

**Abstract author(s):** Matzig, David - Hussain, Shumon - Riede, Felix (Aarhus University)

**Abstract format:** Oral

The Final Palaeolithic is often said to signify a consequential departure from the developed European Upper Palaeolithic and its pan-continental techno-complexes, spawning a heterogeneous and regionalized landscape of small-scale taxonomic units. While there is a long tradition of focused regional research perspectives in archaeology, trans-regional syntheses to question this supposed process of cultural diversification have rarely been attempted or successful, as they have traditionally required a great deal of abstraction from primary or even secondary data sources and an epistemologically informed approach which is often missing and only partly developed. With more and more computational approaches finding their way into archaeology and the push towards Open Science, the task of tackling this problem has both become pressing and considerably more realistic.

We here present the preliminary results of an archaeological meta-analysis focused on the relationship between the proposed cultural taxonomic units of the European Final Palaeolithic, testing their underlying morphological similarities and differences by using geometric morphometric shape analysis on lithic point-types from selected key-sites all over Europe. We provide first insights into



how this cultural variability, now empirically analysed and “measured”, is structured spatially and to what degree it overlaps with the traditional culture-historical schemata and narratives. Furthermore, we briefly discuss how our endeavour resonates with aspects of data availability and the need for increased methodological transparency in archaeological practice.

104 **SIGNALLING INTENT: BEACONS AND MILITARY COMMUNICATIONS FROM ANTIQUITY TO EARLY MODERN TIMES**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Ødegaard, Marie (Museum of Archaeology, University of Stavanger) - Brookes, Stuart (UCL Institute of Archaeology) - Lemm, Thorsten (Centre for Baltic and Scandinavian Archaeology, Stiftung Schleswig-Holsteinische Landesmuseen) - Iversen, Frode (Museum of Cultural History, University of Oslo)

**Format:** Regular session

This session explores the potentials of an archaeology of military communications. From antiquity to the present day, armed forces required systems of military communication: to coordinate troops in the field, warn of imminent threats, and signal between naval and terrestrial forces. A range of written, archaeological and toponymical evidence confirms the importance of beacons and lookouts to the networks of local and regional communications; systems with fire on mountain peaks are attested by Homer and similar systems were used all over Europe until the Napoleonic Wars. Recognising how and where such communications worked is fundamental to understanding systems of military organisation, defensive capabilities, and the nature of hostilities in the past – yet they have so far featured little in archaeological debates. This session will examine the problems and potentials of this topic. What is the archaeological signature of beacons, look-outs, and signalling systems? How can systems of visual and audible signals be reconstructed? What are the relationships between communications, landscape, and better-attested military installations, such as strongholds, linear defences, routes and landing places? How does an archaeology of military communications give insights into the social worlds of past people; how does the routinization of war and the threat of attack affect people and their institutions?

Contributions are sought from scholars working in archaeology, history, toponymy, landscape studies. We particularly welcome papers that discuss the physical evidence for military communications; the geographic extents of beacon and other signalling sites; papers that explore their links to mobilisation, movement, strategy, and other military sites and defense networks (e.g. hillforts, castles, place names indicating military personnel/places, earthworks, and power centres, etc); and the social dimensions of civil defence and its impacts on people.

**ABSTRACTS**

1 **VIKING FEAR AND DEFENCE – BEACON SITES IN NORWAY**

**Abstract author(s):** Ødegaard, Marie (Museum of Archaeology, University of Stavanger)

**Abstract format:** Oral

A range of written, archaeological and toponymical evidence confirms the importance of beacons and lookouts to the networks of local and regional communications that existed during the Viking Age in Scandinavia. Despite this, few beacon sites have been mapped, dated and studied in a regional and cross-national perspective. While the large fortified centres of the Viking Age are well known, their connections to smaller-scale local fortifications have yet to be explored.

This paper will discuss beacons and networks of military communications within the existing and emerging kingdoms of Norway in the Viking Age. The beacons were systematically placed, so that they were visible from one to the next, in the landscape. The aim is to study their distribution, the organisation of the system and the beacons role in the social and military organisation of the period. This paper will study beacons in two border areas belonging to different historic law areas: Agder in Western Norway and Østfold in Eastern Norway. Together, documents, place-names and landscape archaeology make it possible to reconstruct elements of the signalling and sighting systems and to define the spatial extents of these military networks.

2 **THE ANCIENT GREEK OPTICS OF SURVEILLANCE AND LONG-DISTANCE COMMUNICATION. PERSPECTIVES ON ARCADIAN WATCHTOWERS IN ANTIQUITY**

**Abstract author(s):** Bakke, Jørgen (University of Bergen)

**Abstract format:** Oral

As in other ancient Greek city-states the territory of Ancient Tegea in the Peloponnesian highlands is demarked with small, well-built watchtowers (skopíai) in stone. Two of the towers that was documented during fieldwork in 2014 is dated to the late Classical/Hellenistic period and are both located on mountain peaks that oversee the central agricultural territory of the Tegean city-state. Early Greek historical sources attest that signaling beacons (phruktôría) in the form of fires lit on mountain tops were used to transmit messages effectively over large distances. In the tragedy Agamemnon Aeschylus thus describes how the message of the fall of Troy was transmitted from the coast of Asia Minor to Argos in the Peloponnese. The watchtowers at Tegea probably functioned as beacons from where signals were emitted. They must accordingly have been interconnected with network of beacons on mountain tops further away from the territory. It is also documented how rural watchtowers and border fortresses served as military obser-

vation posts and also as a part of the territorial defense network. What is less well understood from the written sources, however, is the role of these observation posts in the surveillance of local agricultural resources, forestry (wood and coal), mineral and stone quarries (especially marble). As will be demonstrated in this paper the documented examples from Tegea offer a glimpse into how such archaeological remains can be used to analyse potential use of skopíai in civil and economic surveillance of city-state territories in Ancient Greece.

3 **THE ROLE OF FORTRESSES IN COMMUNICATION AND PROTECTION**

**Abstract author(s):** Rama, Zana (Archaeological Institute of Kosovo)

**Abstract format:** Oral

Fortresses played a key role in the creation of communication with the different areas of the territory, to control the area, to warn of imminent threats, to organize defense and to protect the population. This paper will elaborate exactly this role of the fortresses in the territory of Kosovo, in the past known as Dardania, located in the southeast Europe, in the Balkan Peninsula.

After the weakening and the fall of the Roman Empire, and due to different tribe attacks, living in the flat areas was not safe anymore, that’s why the population started to massively move back to the hills. Fortifications became the main settlements during the Late Antiquity. The location of fortresses on top of the hills had better natural protection, but also had control of the area, the main roads, the still inhabited towns etc. According to Procopius of Caesarea in “De Aedificiis”, during the rule of the Byzantine emperor Justinian the Great, 61 fortifications were reconstructed and 8 were constructed in the territory of Dardania.

Based on the use and the architecture of the fortresses, they were of different types; some were used as settlements, some for religion reasons as pilgrimage, others as watchtowers or military stations to control important economic and trade routes, as well as to protect or alert the settlements located in the lower parts of the territory.

4 **MILITARY COMMUNICATION SYSTEMS IN IRON AGE SOCIETIES: AN ARCHAEOLOGICAL STUDY OF THE SOCIAL ORGANIZATION OF THE WARRIORS**

**Abstract author(s):** Bertaud, Alexandre (Ausonius, University Bordeaux Montaigne)

**Abstract format:** Oral

The communication tools let very few traces in the archaeological records because most of them are related to sound, voice or visual sign which are ephemeral and they disappear during the transmission of information. The ephemeral aspect of the signalling can sometimes be filled out with textual sources which can explain some part of the beacons and communication systems. However, this is a difficult approach on Late Prehistorical societies, like Iron Age societies, due to the lack of written sources and their biased side from classical authors. The study of military transmission system is yet very important to fully understand the organization of warriors and societies. In this paper, I will analyse the remains of the transmission tools associated with warfare. These tools are associated with sound through specific music instrument, and in a large part with visual semaphore. This last aspect is probably the more visible and invisible due to the support of information but the total lack of any intelligible transmission tool. These two main aspect can also be associated to emphasize the visual information through the sound, and inversely, like on the most famous music instrument of Gallic people: the carnyx. Beyond the functional aspect, the archaeological context analyses will provide good evidence to understand the organization of armies from the Second Iron Age in Western Europe.

My proposal is to define the military communication tool from the late prehistorical societies of Western Europe, from the archaeological records, in order to understand the organization of the warrior groups, to discuss the possibility to define these warriors as army, and to approach the organization of these armies.

5 **FIRES OVER ENGLAND - SOURCES FOR AND FUNCTIONS OF VIKING-AGE SIGNALLING**

**Abstract author(s):** Brookes, Stuart (UCL Institute of Archaeology)

**Abstract format:** Oral

Beacons and lookouts played a key role in the networks of local and regional communications of Anglo-Saxon England during the Viking Age. While the large fortified centres of the period are well known, the nature of interconnections between them and smaller-scale local arrangements have only recently received attention. Place-names, written evidence and landscape archaeology together allow for the reconstruction of elements of signalling and sighting systems. This contribution presents the historical context within which beacons and lookouts developed, and draws upon a series of case studies to reveal local systems of communication in the landscape of Anglo-Saxon England. Of particular interest are the systems of mobilisation that supported beacon systems, including mustering sites and the territorial organisation of military units. The paper will also discuss experimental fieldwork carried out in 2016 that tested the notion of transmitting a signal from early medieval beacon sites along the Icknield Way in Buckinghamshire, England.

6 **WATCH-AND-WARD: A LANDSCAPE STUDY OF COASTAL DEFENCE ON THE ISLE OF MAN**

**Abstract author(s):** Johnson, Andrew (Manx National Heritage)

**Abstract format:** Oral

The Isle of Man is a small island of just 580km² in the centre of the British and Irish archipelago. It lies well within sight of the Scot-

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tish, Irish and English coastlines to the north, west and east, and rather less so of Wales to the south. Seaborne communication has inevitably played a role in the island's history throughout time both from the neighbouring shores and further afield.

Numerous promontory forts of apparently Iron Age origin suggest a concern for coastal protection from at least the late prehistoric period, but with the advent of Viking raiding and trading in the Irish Sea from the late 8th century, the need to police the island's 100-mile coastline grew significantly. Early 15th century laws record a responsibility for 'watch-and-ward' - requiring local militia to guard the coastline night and day - which is believed to date from several centuries earlier, and is known to have continued until at least the 17th century.

Earlier research has previously proposed that certain Iron Age promontory fortifications were re-used as watch stations and beacons during this period, and now this has been expanded, through the use of GIS and fieldwork, to make better sense of how these watch stations functioned, during day and night, in the coastal landscape in which they are set. Investigations are also drawing on historic statutory provisions for the guarding of the coastline, the mustering of larger forces in times of dire need, and the logistical practicalities of policing a long and varied coastline, at times eminently defensible and at others more vulnerable, where topography and access can both help and hinder those on shore and at sea.
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### GAME OF THRONES OF EARLY VIKING AGE DENMARK? - THE VIKING ARISTOCRATIC SITE AT ERRITSØ

**Abstract author(s):** Ravn, Mads (Vejle Museums)

**Abstract format:** Oral

New investigations now suggest that the early, fortified Viking elite residence at Erritsø in Jutland (Denmark) played an important strategic and military rôle in the 'Game of Thrones' of the 9th century early Viking Age. The size and extent of the site supports this, as does its site-continuity and position in the landscape in relation to military and royal place-names. The presence of a moat and a palisade also suggests a defensive aspect, which also important beacons and communication routes in the immediate surrounding do. In addition, independent written sources indicate an important strategic meaning to this site.

Archaeological investigations over the past years by the Vejle Museums have added significant new knowledge and dates that are more precise from this site. In concert, they underpin together with newly discovered sunken huts (Grubenhäuser) that it was an extraordinary elite residence with significant craft activity possibly throughout the year. On top of this, a newly discovered new 50 meter long, three-phased hall found 60 metres to the east support the assumption of a long site continuity.

In this lecture we will reveal new, absolute dates and finds that support that the great hall has an older phase close-by. Building-technical comparisons with identical sites of elite residences in nearby Zealand towards the east, Tissø and Lejre and absolute dates support this contention.

Also, we will discuss the military and royal connotations to the site. Indeed, several place-names, written sources and the landscape itself point towards the contention that this place was a royal site.

We will try to link this place up to an actual historical event reported in Frankish Annals from AD 815 about an expeditionary force sent by Louis the Pious into the land of the Danes in order to punish the Danish kings.
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### THE BEACONS OF KNOWLEDGE - THE DISCOURSE OF SCANDINAVIAN BEACON SYSTEMS

**Abstract author(s):** Nytun, Arve (Dept. of Culture heritage, Møre og Romsdal county, Norway)

**Abstract format:** Oral

The fire warning beacons in Scandinavia have often been related to the Levy organisation and the rise of the kingdoms that came to be Norway, Denmark and Sweden. Espacially this is the case with Norway. But why?

By analysing the history of research of the pre-reformation Nordic beacon systems, it becomes obvious how different approaches in different nations have constructed unique views, in the use of, and the development of the organisation of the systems, in the dimensions of space and time.

Going through the history of research, your able to see how different sources from historical literature (the sagas and landscape laws) to material culture, have affected how the material has been interpreted. You can identify the development of discourses related to different academic disciplines and traditions and to regional and national landscapes.

The focus will be to show how Archaeology have contributed in the research, and what investigations that have been done in relation to the material culture.

By studying the topographical landscape around the early mediaeval town of Borgund. I will show what methods can identify signalling sites on the west coast of Norway, and how the sites can be related to time and space, with the combination of multidisiplinary approaches.

Discussion: The written sources basically comes from the sagas, and early landscape laws. Especially in Norway, this has led to a discourse heavily connected to nationalistic view, related to the Viking- early medieval period and the developing of the levy organisation, even with the lack of archaeological data supporting this."

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### PROTECTING HEDEBY – RECONSTRUCTING A VIKING AGE MARITIME DEFENCE SYSTEM BASED ON VISUAL COMMUNICATION

**Abstract author(s):** Lemm, Thorsten (Centre for Baltic and Scandinavian Archaeology)

**Abstract format:** Oral

The famous Viking Age trading site of Hedeby is situated at the inner end of the Schlei, a 40km long inlet of the Baltic Sea, which is characterised by a few wide sections, a number of bends and several narrow passages. A couple of prominent heights especially on the northern shore provide good overviews of different parts of the inlet, while the many and in some cases hidden coves create the impression of natural harbours. In other words, the Schlei seems to have been a perfect scenario for the implementation of a maritime defence system in order to protect Hedeby.

Nevertheless, so far the archaeological evidence in the form of sea barrages and warrior graves allows only selective insights into defensive structures and military organisation. However, by taking into account the toponymical evidence, i.e. Viking Age/Early Medieval place names referring to warriors, war-ships, look-outs and signal fires, the spectrum of military defence components becomes much wider and a more reliable basis is created for conclusions to be drawn on. In addition to that, a crucial part for the interpretation is taken by GIS viewshed and visibility analyses, which help in linking the different military components with each other.

The paper will discuss the possibilities of reconstructing a maritime defence system at the Schlei inlet and intends to give an impression of such a system in action.
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### AN ARCHAEOLOGICAL EXPERIMENT IN LARGE SCALE. THE MILITARY COMMUNICATION OF THE VIKING AGE REESTABLISHED

**Abstract author(s):** Runge, Mads - Mogensen, Mette (Odense City Museums)

**Abstract format:** Oral

As part of an ongoing research project, From Central Space to Urban Place, the Viking Age ring fortress Nonnebakken in Odense in the middle of Denmark is set in a wide frame of landscape and chronology. The project thus mapped the military elements from the period AD 400-1100 in the region as these are seen in archaeology, toponomy and topography. In this way a new and detailed view into the military structures of the time is created.

An important element in this work is the analysis of the possible beacon localities. The beacons are found by toponomy and topography and possible internal connections underlined by view shed analysis. Archaeological excavations at the beacon localities is missing, but it is also assumed that the physical remains of a beacon are few or absent.

To assess whether the possible beacon localities might have played a role in the military structures in the Viking Age a unique archaeological experiment was conducted. The experiment was part of a huge event, where local stakeholders lit fire (in racks) on the beacon localities to see if it was possible to see from one beacon to the next. The experiment created in this way a line of fire of approximately 30 km.

The project provided important knowledge and did at the same time make a unique dissemination and understanding of a total fossil, Viking Age cultural landscape. By involvement of school classes and other local stakeholders a large local involvement was established.

The results of the project underlined the potential of analyzing the military organization of the Viking Age in a new geographical scale and could qualify the more traditional archaeological analysis. All in all, it the multifaceted approach made it possible to get a sense of the military organization in a diachronic, regional perspective.
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### BEACONS AT THE TRØNDELAG COAST, NORWAY – SEA MARKS OR RELICTS OF A SCANDINAVIAN IRON AGE MILITARY COMMUNICATION?

**Abstract author(s):** Maixner, Birgit (Department of Archaeology and Cultural History, Norwegian University of Science)

**Abstract format:** Oral

The paper takes it point of departure in the inventory of beacons at the coast of Trøndelag, Central Norway. Place names indicate a huge number of more than hundred beacons in the area, which distribution do not only follow the coast, but also the inland waterways. Beacons are mentioned in the Frostathing law as part of the leiðdangr institution, and are thus assumed to have existed in the Trøndelag district since the 10th century AD. However, the lighting of fires on high places or hills as part of a signalling system might be much older. There are several examples that beacons occur side by side with hillforts from the Scandinavian Iron Age. As a rule, the perishable constructions of the beacons would leave few physical remains. Yet, beacons are difficult to date, especially when they were in use over a long time, which is the case in Norway, where the beacon system was still in use in the 19th century. Moreover, in coastal districts, it might be difficult to distinguish whether lights constituted navigational aids in times of peace, or were part of a military communication system that should warn of imminent threats. To investigate the potential function of the beacons in the area, the distances between them, and their relationship to traffic routes, strategic positions and hillforts is analysed. It is argued for that the distribution of many of the beacons in the area shows a striking correlation with Iron Age settlements and centres, and that the function of the majority of them therefore might be associated with matters of warning and maritime control.

CARDONA’S CASTLESCAPE (BARCELONA). ANOTHER APPROACH

**Abstract author(s):** Pancorbo Picó, Ainhoa (Town Hall of Cardona)

**Abstract format:** Oral

The castle of Cardona, already mentioned in the written sources of the year 798, has undergone numerous modifications, especially since the 17th century and, in the early 1970’s, when it was converted into a hotel. As a consequence, archaeological remains of its early constructions will be hardly found.

It was strategically located, controlling the extractions of the valued salt, for its location in height and in relation to the road network in the current central part of Catalonia. The domain of the territory was guaranteed by a network of castles, beacons and lookouts distributed around the main road, traditionally studied from concepts now surpassed by modern archaeology, which implies a vast range of interdisciplinary studies. This is allowing us to draw new, more complete and more precise discourses in relation to the castle itself and to the implementation of these other constructions.

In the case of Cardona, in addition to the necessary approach to the surrounding castles, which are more well known and even some of them have been excavated during the last few years, we will also review its castlescape, specially from the western road that led to the fortress, the medieval town and de salt outcrops. The thorough surveying of the territory, the written documentation, the toponymical evidence and some archaeological remains partially studied during the 1990’s have been the main sources of information.

All these studies confirm the existence of different kinds of structures in height that, together with the establishments down at the valley allowed to control, as we will see, its total length.

PATHS AND VISIBILITY BETWEEN THE CHRISTIAN MILITARY POSTS AND THE FORTRESS OF ALCALÁ LA VIEJA (SPAIN): UNDERSTANDING A MEDIEVAL SIEGE

**Abstract author(s):** Ramirez Galan, Mario (University of Portland)

**Abstract format:** Oral

In the Middle Ages, territory control was one of the most important aspects to defend lands and kingdoms. Based on this argument, the construction of defensive structures (such as castles and watchtowers), played a decisive role to defend the realms against possible military actions. However, the data and information provided by the narrative sources may not be enough to understand how the system worked. The castle of Alcalá la Vieja is not an exception. In addition, the study of the siege of Alcalá la Vieja is particularly more complicated due to the inexistence of correct information and data about it.

In order to face this situation, interdisciplinary studies were needed. Especially the application of spatial analysis in archaeology. The main goal of our work was filling those gaps in the narrative sources: what really did happen in 1118, when the Christian army attacked the castle—on separate occasions—until they finally penetrated the Andalusian fortress? To solve those questions, we analyzed the visual control from the castle of Alcalá la Vieja—which is situated in Alcalá de Henares (Madrid, Spain)—to understand its capacity to control the territory. Furthermore, we modeled several routes from one of the Christian posts to see the most likely attack routes. These, combined with the visual areas from the castle, helped to understand the course events during the siege. Another important aspect had to be analyzed: the intervisibility between Christian locations, to know if they could communicate between themselves.

TURNING PERIMETERS INSIDE OUT: LOOKOUTS AND BEACONS IN THE STRAIT OF GIBRALTAR CULTURAL FRONTIER AREA, C. 1350 - C. 1690

**Abstract author(s):** Elbl, Martin Malcolm (Portuguese Studies Review; Baywolf Press; Trent University)

**Abstract format:** Oral

The paper is an offshoot of a long-run project (2012 to present) dedicated to the study and geoarchaeological and historical re-evaluation of pre-Portuguese, Portuguese, and post-1683/1684 urban and open-field defensive structures in the greater Bay of Tangier area, with selected extensions now encompassing for comparative purposes Asilah (Arzeila) and its micro-region, Ksar es-Seghir, Ceuta, Tétouan and its micro-region, and portions of the adjacent Rif coast to the East. This particular aspect of the project, using archival data, chronicles and other narrative sources (including military memoirs), historical topographic and toponymic evidence, satellite imagery, aerial photography, and on-the-ground verification, focuses on known, confirmed, or surmised locations of respectively Moroccan and Portuguese/Spanish lookouts and beacon posts – with or without attested/verified material signature – along the south shore of the Strait of Gibraltar. Many of these posts are mentioned and/or have been summarily described in the existing literature, but a systematic survey, in a context of historical landscape analysis, is currently not available. Likewise, computer-modelled intervisibility analyses (DTM-based) have generally not been carried out, either for discrete known posts or for known systems of mutually supporting posts that conveyed forward observer data to decision-making or resource mobilization centres (i.e. Portuguese/Spanish colonial port enclaves and Moroccan-held territorial hubs). The paper explores the evolving viability and functionality of these posts and clusters, discusses the average documented and/or modelled lead time between alert/warning and response, and maps out the changes in lookout perimeter functionality and extent, contingent on first the establishment and then the gradual abandonment of historic Iberian shore enclaves in northern Morocco.

ARCHAEOLOGY OF THE SILK ROAD: ANCIENT PATHWAY TO THE MODERN WORLD

**Theme:** 2. From Limes to regions: the archaeology of borders, connections and roads

**Organisers:** Franicevic, Branka (University of Bradford) - Hoppál, Krisztina (MTA-ELTE-SZTE Silk Road Research Group)

**Format:** Regular session

The Silk Road used to be a crucial link between Europe and Asia where commodities, religions and entire philosophies were exchanged. Accordingly, there was a good reason why the cultures along these trade routes prospered. However, the migratory practices of the Silk Road also had the potential to allow for the spread of infectious diseases and cultural conflicts. This session explores the ways in which these roads were instrumental in transforming frontier regions over their period of use, circa 130BC to 1453AD. In doing so, it sets to expand new evidence of intercultural exchange in both directions along the Silk Road. What were the impacts of the trade routes on building and preserving the settlements? How did the trade network affect daily life in regions it went through, in terms of health and lifestyle? What could the blend and dissemination of art tell us about the travel of people, their ideas and beliefs? We are interested in interdisciplinary approaches, theoretical interpretations, and new imagery technologies. We welcome new findings on civilian settlements in the regions of the trade routes, the spread of infectious diseases as well as the molecular genetics results on ancient DNA. We also encourage interpretations of material remains that were transported back and forth on the Silk Road including coins, textiles, and ceramics. The geographical areas of our interest are Europe, The Caucasus, and the Near East. However, papers from other regions are also welcome.

ABSTRACTS

CARAVAN ANIMALS: DISTRIBUTION OF WEALTH AND DISEASE

**Abstract author(s):** Franicevic, Branka (University of Bradford)

**Abstract format:** Oral

From the time the Silk Road opened trade with the West until its decline little thought was given to the role of animals in shaping its legendary route networks. With an aim to understand the process of bringing together civilisations, the archaeological record focuses mainly on trade routes and trade goods. Judging by the scarcity of other evidence, it would appear that domestic animals and wildlife had been mainly consumed or/and used for transport. However, as new cultures and beliefs were exchanged, different functions animals had in everyday life were inevitably introduced and adopted. It is, therefore, possible that these functions justify only certain aspects of connecting East to West. This paper argues that the heartbeat of the Silk Road was essentially the animals that were intimately connected with its making, existence and its decline. In doing so, it discusses them as keys to the trade and international relations to include the animal role in the creation of the Silk Road, the silk-making, transportation, trade of luxury goods, religious belief, military support and the spread of disease. A proposed framework of the study is a combination of theoretical interpretations, iconography and imagery, and the material evidence.

RECONSIDERING THE ROLE OF CENTRAL ASIA IN THE MAKING OF ISLAMIC GLAZES DURING THE 9TH TO 13TH CENTURIES CE

**Abstract author(s):** Ting, Carmen (University of Cambridge)

**Abstract format:** Oral

Islamic glazes are not only appreciated in museums worldwide, but they are also considered to have been the forerunner to the emergence of glazed wares as a global phenomenon since the medieval times. However, the current discussion on the development of Islamic glazes has largely overlooked the evidence from Central Asia, even though local glazed wares production did not begin until after the Arab conquest. Thus, this study will examine, for the first time, how glazed technologies developed in Central Asia, with special consideration to how such technologies might have transferred and exchanged through the region’s involvement in the trans-Eurasian Silk Road trade. Glazed ware assemblages from production sites in Bukhara, Samarkand, and Merv – which were major oasis cities participating in Silk Road trade – are the focus of this study. These assemblages comprise a wide variety of ware types, including monochrome or polychrome painted, monochrome glazed, and sgraffito, dated to the 9th to 13th centuries CE, the period when Central Asia was under the direct or indirect Islamic rule. Thin-section petrography and scanning electron microscopy energy dispersive spectrometry were used to reconstruct the range of technical practices characteristic of the local productions in Central Asia. The resultant data are then compared with the published ones on Chinese, Byzantine, and pre-Islamic Mesopotamian traditions to highlight the potential connections between the Central Asian technologies and established glaze traditions that can be found along the Silk Road. The new evidence from Central Asia is expected to contribute to redefining what Islamic glazes truly entail, both in terms of technological repertoire and craft organisation, and delineating the nature and extent of social processes and cultural interactions that stimulated technological changes.



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### A COMPARISON OF THE ROLE OF RELIGION IN THE DEVELOPMENT OF URBAN PLACES AROUND THE NORTH SEA AND IN JAPAN

**Abstract author(s):** Hutcheson, Andrew (University of East Anglia; Sainsbury Institute for the Study of Japanese Arts and Cultures)

**Abstract format:** Oral

During the 6th to 10th centuries in northern Europe, around the North Sea, and in Japan, two major world religions, Christianity and Buddhism, play a perhaps a critical role in the development of urban places. Institutions of monasticism and kingship interacted to implant continental models of towns. In England some of the Christian evangelists, starting with Saint Augustine, brought a late Roman concept of the city with them. The contemporary early-medieval conceptualisation of a town may have been a complex construct based on the ecclesiastic ideal of a city, perhaps in part based on ideas expressed within Augustine's City of God; the reality was more prosaic. We can also see around the North Sea that trading settlements develop into urban layouts. Many of these sites have the term *wic* incorporated in the place-names. These seem to be separate from the ecclesiastical centres. With conversion to Christianity large-scale burial monuments, like those at Gamla Uppsala and Sutton Hoo, stop being constructed.

Japanese urban forms imported from China are replicated in the layout of new palaces and towns. First in the Nara basin at Asuka then a little later at Nara itself. The adoption of the Chinese urban forms is confident, with major settlements implanted by the ruling Yamato clan, influenced by monastic communities. Similarly in Japan large burial monument building came to an end, coincident with the adoption of Buddhism. Here though the scale of these burial monuments was much greater: Kofun tombs are some of the largest monuments from antiquity anywhere in the world.

Our project, Nara to Norwich: Art and belief at the extremities of the Silk Roads AD 500-1000, will look at the archaeological evidence available pointing towards religious influence upon urban settlements. How landscapes of conversion progressed with the adoption of Christianity and Buddhism by ruling groups.

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### ALL ROADS LEAD TO THE EAST? INTERPRETING ROMAN OBJECTS DISCOVERED ALONG THE EASTERNMOST SECTIONS OF THE SILK ROAD(S)

**Abstract author(s):** Hoppál, Krisztina (MTA-ELTE-SZTE Silk Road Research Group)

**Abstract format:** Oral

In Antiquity, Silk Road(s) were central to interactions between East and West linking the Classical world and Asia through the chain of intertwined networks of communities, in which information, ideas, cultural elements, and artifacts were transferred across land and sea.

Although studying these early exchange networks can be considered a relatively popular field of research, the intensity and patterns of such complex system still leave a lot of questions, particularly in case of interactions between the Roman Empire and East and Southeast Asia. A variety of artifacts can be interpreted as indicators of links between these remote regions, but the different levels and nature of these connections has been less recognized. Many of the Roman objects from Thailand, Vietnam, Indonesia or China are either lacking archaeologically secure context or were unearthed as results of different archaeological agendas and excavation focus applied in these different regions. Such unevenness of information requires meticulous (re)-interpretation and systematic categorization of Roman artifacts in order to envisage the heterogeneous ways and degrees of interactions they signify.

This presentation illustrates different categories of Roman objects such as exquisite genuine objects, less distinctive mass products, and modern time arrived antiquities discovered along the easternmost sections of the Silk Road(s), and highlights their diverse roles in networks of Silk Road(s) communities.

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### THE DZHETYASAR CULTURE - STATE FORMATION ON THE IMPERIAL PERIPHERY

**Abstract author(s):** Goffriller, Martin (China University of Mining and Technology)

**Abstract format:** Oral

The Dzhetyasar region of Kazakhstan is located along the southern deltaic sector of Syrdarya River on the eastern shores of the Aral Sea, roughly between the modern cities of Baikonur and Kyzylorda. The Syrdarya and its many now defunct tributaries formed the hydrological backdrop to a culture which thrived in this area, roughly from the 1st century BCE until the 8th century CE. Its origins, political structure and ethnic makeup are still very much a matter of discussion, though it is certain that with over 50 settlements of various sizes the Dzhetyasar communities played a central role in the economic convection of the Northern Silk Road and Central Asia at large for much of the early Middle Ages. In addition to being mercantile middlemen, the Dzhetyasar's location at the interface between the nomadic world of the steppes and the great urban empires of Persia, Khorezmia and the Tang Dynasty positioned them at the fulcrum of many of the period's great geopolitical events.

The present paper will focus on two primary questions as regards the evolution of the Dzhetyasar culture: firstly, to what extent did this culture develop into what might reasonably be called an urban state, i.e., centralisation of power, ritual and tributary mechanisms, representative architecture, etc. Secondly, to what extent are political processes such as the collapse of the Sassanian state, the Islamic conquest and/or the An Lushan Rebellion during the 8th responsible for the eventual demise of the Dzhetyasar settlements in this period.

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### THE NALA SOPARA SURFACE SURVEY PROJECT – A REPORT ON THE ARCHAEOLOGICAL INVESTIGATION OF THE ANCIENT INDIAN OCEAN PORT

**Abstract author(s):** Smagur, Emilia (Institute of Archaeology, University of Warsaw) - Abbas, Riza - Toraskar, Sitaram (Indian Numismatic, Historical and Cultural Research Foundation, Mumbai) - Romanowski, Andrzej (The Department of Coins and Medals, National Museum in Warsaw; Institute of Archaeology, University of Warsaw)

**Abstract format:** Oral

Since ancient times Indian ports have played a vital role in trade and commerce, both international as well as local and regional. One of the chief ports of the Konkan coast was Sopara, mentioned in the Periplus and by Ptolemy. Its antiquity and importance have been confirmed archaeologically by various excavations which were, however, superficial. Therefore, the systematic study of this ancient port site was lacking.

In our paper we will discuss the results of the pilot research project conducted in January 2020 by the team from the Institute of Archaeology, University of Warsaw and the Indian Numismatic, Historical and Cultural Research Foundation in Mumbai, which aimed to study and document an archaeological landscape of Sopara. We will present the result of the surface survey, which was supplemented by the UAV mapping, metal detector survey, auger coring and GIS analysis. Those data will shed a new light on how people living in Sopara used the landscape and interacted with it, on the urban planning of the ancient port site, as well as on the long-term development of Sopara. The role of Sopara as both member of the greater South Indian cultural landscape, and as a participant in Indian Ocean trade relations will be discussed as well.

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### THE INTEGRAL ROLE OF AKSUM IN ANCIENT AFRO-EURASIAN TRADE NETWORKS: A NEW ARCHAEOLOGICAL ANALYSIS IN PROGRESS

**Abstract author(s):** van Aerde, Marike - Botan, Samatar (Leiden University)

**Abstract format:** Oral

This paper examines the often neglected but integral role that the African kingdom of Aksum played in the exchange processes of the early Silk Road trade networks that connected East Africa and Eurasia in the early first millennium CE. Predominant focus is often paid to connection during this period between the Mediterranean region, via the Indian Subcontinent, to China. However, as new archaeological finds show, East-African trade centers in North-African and Sub-Saharan regions, ranging from Egypt to Mozambique, were an important node in this network from as early as the Roman period. One of the most influential and crucially situated African centers was the Aksum kingdom (current-day Ethiopia and Eritrea), with its main port of Adulis. Aksum functioned as physical cross-roads between the Red Sea and the southern Arabian Peninsula, and between south-eastern African ports and the Indian Ocean. Due to the problematic colonial excavation history of Aksumite sites in the early 20th centuries, archaeological evidence of Aksum and its ports has been scattered and/or neglected in Silk Road studies, until recently.

In this paper, we will discuss initial findings of our ongoing analyses of Aksumite sites and, especially, Aksumite ceramics dating from the early 1st millennium found across East-Africa, the Arabian Peninsula and West-India (Gujarat). By using this transregional approach to chart out exchange routes and nodal points in the networks based on archaeological material rather than on traditional textual references, and with focus on the spread of Aksumite ceramics in particular, our aims are: (1) to attain detailed knowledge of Aksumite archaeological materials and their wider distributions, and (2) through pattern-recognition of transregional databases, to effectively use our findings to address larger questions of intercultural exchange and connectivity between Africa and the eastern regions of the early Silk Road networks in the early historic period.

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### TABOO AND THE LACK OF REPRESENTATION OF MENSTRUATION IN ARCHAEOLOGICAL STUDIES. IT'S A BLOODY SHAME!

**Abstract author(s):** Newbury, Dulcie (Student - University of Bradford) - Croucher, Karina (University of Bradford)

**Abstract format:** Oral

Menstruation has been scarcely studied within archaeology, meaning that representation of menstruation in archaeology is lacking. Although archaeological studies focus on fertility rites and rituals, depictions of the female body, and social divisions, most do not consider menstruation a viable area of study within archaeology. Concepts of purity and impurity in relation to menstruation are present in many societies (both past and contemporary) and these ideas will be examined in relation to the migratory practices of the Silk Road.

This research will determine what types of evidence of menstruation (if any) can be found in the archaeological record. This information will be collated to create a body of information that can be used in future studies. An analysis and critical review of our views surrounding menstruation in contemporary society has been completed to highlight the impact of these views on the study of menstruation in archaeology. The study of menstruation in the past can reveal new, important information on aspects of the past such as divisions of labour, community organisation, and the spread of practices and beliefs.

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ORGANIC NETWORKS: TRACING THE PROCUREMENT, TRADE AND EXCHANGE OF PLANT AND ANIMAL RESOURCES IN THE ARCHAEOLOGICAL RECORD

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Mooney, Dawn Elise (Museum of Archaeology, University of Stavanger) - Guðmundsdóttir, Lísabet (University of Iceland)

**Format:** Regular session

The origin of raw materials is of fundamental importance in many archaeological investigations, allowing us to investigate patterns in exploitation of local resources along with regional, national and international trade networks. Provenancing studies have been particularly important in the case of inorganic raw materials which can only be found in certain limited parts of the landscape, such as various types of stone, ore and precious metals. These often form the basis of complex, long-distance trade networks which can shape cultural as well as economic links between distant communities. What is sometimes left out of the story is that the same can often be true of resources derived from plants and animals such as foodstuffs, timber, resin, fibres and cloth, horn, ivory, and pelts. The availability of particular plants or animals in a region is entirely dependent on local climate and environment, or on human agency. Such materials may circulate on a relatively local scale due to specialisation of production in certain areas, or local shortages or unsuitable growing conditions (temporary or permanent) might necessitate the import of timber and/or plant or animal foodstuffs. At the other end of the scale, plants and animals or materials deriving from them may be traded, exchanged or gifted over great distances as exotic or prestige items. This session welcomes studies from all time periods which explore these and related themes, especially those employing innovative scientific techniques.

ABSTRACTS

- 1
- FUEL FROM THE PORT: CHARCOAL ANALYSIS AND ARCHIVAL DOCUMENTS TO STUDY THE WOOD FUEL SUPPLY IN BARCELONA (14TH-18TH CENTURIES)

**Abstract author(s):** Bianco, Sabrina (Institut Català de Paleoeccologia Humana i Evolució Social - IPHES, Tarragona; Dipartimento dei Beni Culturali, Università degli Studi di Padova) - Soberón Rodríguez, Mikel (Universitat de Girona - UdG; Freelance archaeologist) - Allué, Ethel (Institut Català de Paleoeccologia Humana i Evolució Social - IPHES, Tarragona; Àrea de Prehistòria, URV Universitat Rovira i Virgili, Tarragona) - Riera Mora, Santiago (SERP, Seminari d'Estudis i Recerques Prehistòriques, Departament de Prehistòria, Història Antiga i Arqueologia, Universitat de Barcelona)

**Abstract format:** Oral

Fuel is the motor of every society and, before the Industrial Revolution, it depended mainly on the availability of trees. Since economic growth was then directly correlated to the quantity of available energy (and vegetation), it caused pressure on the environment. Despite being such a key raw material for cities, wood fuel economy received little detailed attention in archaeology, even less when considering historical chronologies. In this framework, recent anthracological samplings in El Born Market archaeological site, located in the centre of Barcelona (Catalonia, Spain) near the ancient port, have been carried out, allowing to shed light on the topic. The aim of this work is to analyse, qualitatively and quantitatively, the wood fuel exploitation in an area of Barcelona between the 14th and the 18th centuries. This implies, on one hand, studying the charcoal material sampled from two domestic contexts in the site, in order to understand the taxa used through time and their proportions. On the other, the origins of this raw material have been investigated by the analysis of the Post-Medieval registers of the “Port anchoring right” (Dret d’ancoratge in Catalan). The latter, in fact, provides data on the origins and tonnage of boats which were importing wood fuel to Barcelona’s port between 1439 and 1550. The multidisciplinary approach allows to relate the vegetation communities exploited through time with the amount and origins of wood fuel imports. Furthermore, the average fuel consumption trend in a pre-industrial urban population like Barcelona can be compared with the amount of entrances in the port, in order to understand how much the fuel supply depended on sea trades. In general, this work provides a preliminary approach to the study of wood fuel supply in Barcelona between Medieval and post-Medieval time, showing the potential of cross-disciplinary work.
- 2

- TRACING THE TRADE OF TIMBER THROUGH ADNA AND SR ISOTOPIC ANALYSIS
- Abstract author(s):** Van Ham-Meert, Alicia (Saxo Institute, Copenhagen University; Department of Geoscience and Natural Resource Management, University of Copenhagen) - Diaz-Maroto Fernández, Paloma (Saxo Institute, Copenhagen University; The Globe Institute, Copenhagen University) - Waight, Tod (Department of Geoscience and Natural Resource Management, University of Copenhagen) - Barnes, Christopher (The Globe Institute, Copenhagen University) - Daly, Aoife (Saxo Institute, Copenhagen University)

**Abstract format:** Oral

Timber was a resource of primordial importance during the medieval period. It was used in a variety of applications, e.g. for shipbuilding, for housing or ecclesiastical decoration. Growth, processing, usage and final deposition of timbers can be far from each other. In the TIMBER project, we seek to explore the use, procurement and trade of timber in Northern Europe during the 11th to the 17th centuries. Shipwrecks provide large quantities of timber for study: both the timbers used for building the ship and those present in

the cargo.

In this project, the study of the movement of timbers is achieved through a combination of archaeology, history, dendrochronology, aDNA and Sr isotopic analysis. As such we want to provide an interdisciplinary framework for answering questions of provenance, trade and use of raw timber and finished products around the Baltic sea.

Historical records provide some information about the trade of timber and the procurement for large (state) projects. Through dendrochronology the felling date and geographical origin can be obtained if appropriate master chronologies are available. In some cases, for example the so-called 'Baltic 1', 'Baltic 2' and 'Baltic 3' oak chronologies built from art-historical objects, we still do not know what the precise geographical origin of the oaks are. The application of Sr isotopic analysis and aDNA on timber remains from shipwrecks can provide an answer to these questions and provide a fuller picture of the stakeholders in the lucrative Baltic trade.

During this presentation, we will explore the possibilities and challenges of aDNA and Sr isotopic analysis of this wood. Furthermore, applying these methods, we will further refine the knowledge on timber trade in Northern Europe.

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (grant agreement No. 677152).

- 3
- WOOD RESOURCES IN THE EASTERN SETTLEMENT OF NORSE GREENLAND

**Abstract author(s):** Guðmundsdóttir, Lísabet (University of Iceland; Institute of archaeology Iceland)

**Abstract format:** Oral

Greenland was settled by the Norse around 985 AD. They founded two main settlements on the west coast, Eysribyggð (Eastern Settlement) in the far southwest Greenland and Vestribyggð (Western Settlement) east of present day Nuuk. The combined population of the two settlements was around 2-3000 people at its height. Fewer than 100 farms were in the smaller Vestribyggð, and around four times that in Eysribyggð. The settlements eventually declined and were abandoned, the Vestribyggð in the 14th century and Eysribyggð by 1450. The cause of this is unknown, but it may have been linked to access to raw materials, such as wood. As well as being used for fuel, heat and light, wood was also essential for building houses, for transport such as boats, carts and sleds, and for furniture, vessels and utensils. In Greenland it is doubtful that the native tree flora could have met all the needs of the Norse. This means they had to supplement it by other means such as importation of timber or the use of driftwood. Wood taxa identifications on wooden artefact assemblages from sites in the North Atlantic has revealed that the Norse relied heavily on driftwood. Written sources suggest that the Norse Greenlanders obtained driftwood from an area called Norðurseta, which is thought to have been in current day Disko Bay area. The distance from Eysribyggð to Norðurseta is over 1000 km and there is only a short amount of time when this area is accessible due to sea ice. Therefore there must have been other areas closer to the settlements where driftwood was available. In this presentation I will discuss driftwood availability in south-west Greenland, how this resource was obtained, and who was in control of it.
- 4
- SR ISOTOPE ANALYSIS OF CHARRED BARLEY GRAINS FROM ICELAND AND WESTERN NORWAY: PRELIMINARY RESULTS

**Abstract author(s):** Mooney, Dawn Elise (Museum of Archaeology, University of Stavanger) - Guðmundsdóttir, Lísabet (University of Iceland) - Andreassen, Rasmus (Aarhus University)

**Abstract format:** Oral

While Iceland lies at the northern limit of modern cereal cultivation, this was not always the case, and palynological analyses, landscape surveys and historical documentary sources provide evidence for past arable agriculture. However, the extent of cereal cultivation in Iceland in the Viking Age and early Medieval period has been the subject of much debate. Generally low quantities of barley grain recovered mostly from wealthy farms have been used as evidence to suggest that cereal cultivation was limited, and primarily used for the production of beer and/or as a status signifier. It is often argued that cereal grain for everyday consumption was imported, and Iceland certainly did have trade links with Scandinavia, especially Norway, in the Viking Age and Medieval period. However, recent excavations in south-western and northern Iceland have produced relatively large quantities of barley which appear to have been grown in Iceland. However, it is impossible to be certain of this from the archaeobotanical evidence alone. With this in mind, strontium isotope analysis ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) was conducted on charred barley grains from Viking Age sites at Lækjargata in Reykjavík, Iceland and Sandeid, Håland and Björkum in western Norway, in order to assess the potential of differentiating between archaeological grain from these source areas based on their Sr signature. This presentation presents the results of this analysis along with plans for future studies in provenancing cereal grain in the North Atlantic region.
- 5

- NEW PLANTS IN GREEK-ROMAN EGYPT: THE CASE OF MYRTLE (MYRTUS COMMUNIS L.)
- Abstract author(s):** Andreozzi, Riccardo (University of Pisa)

**Abstract format:** Oral

The influx of immigrants into Egypt after its conquest by Alexander the Great and later by Augustus caused deep transformations in its social and cultural structure in a clearly multicultural way. Under these foreign rulers, the exploitation of plants in Egypt changed too: new vegetal species were imported, and new crops established in order to satisfy the tastes and habits of the recently arrived inhabitants. Myrtle (*Myrtus communis* L.) was among these new species. Although it is not native to Egypt and instead grows in

the Western Mediterranean and Southern Europe, it has been imported and cultivated in Egyptian gardens during the Greco-Roman Period. Myrtle berries were consumed as food and its aromatic leaves and twigs found their employ in the production of wreaths and garlands, which constitutes today the greater part of the archaeobotanical remains of this plant. This contribution aims to review the archaeobotanical remains of *Myrtus communis* L. in Egypt, including some new data collected through a survey in the Kew Gardens collection. As much attention as possible is paid to the contexts of the finds in order to understand the importance of this new crop. Importance will also be placed on textual sources. Although an Egyptian name for myrtle does not seem to exist, Greek papyri from Egypt clearly mention the myrtle and its cultivation. The intersection of archaeobotanical and textual data is then significant for a deeper comprehension of the exploitation of this plant. Finally, some considerations will be made about the morphological characteristics and their implications of the myrtle branches so far investigated, as well as some thoughts about further possible analysis of the vegetal material in order to better understand their provenience and relationship with other myrtle populations in the Mediterranean.

6 THE ROMAN “HEDGEHOG-SKIN-INDUSTRY”: PROCUREMENT, USES, COMMERCE, BREEDING, “FORGERIES”

**Abstract author(s):** Messieux, Nicolas (Independent researcher)

**Abstract format:** Oral

Different species of Hedgehogs (Erinaceidae) all have in common the spines on their dorsal face. They can, thanks to a special muscle, roll into a ball with the spines pointing outwards to deter predators. This system of defence is of no use against humans, who have been able to hunt or trap hedgehogs and use them for food, medicine, and their skin.

Pliny's *Naturalis Historia* (AD 77) is the main historical source describing the uses of hedgehog skins. They were used for carding and had quite an economical importance. They were protected by monopolies and decrees and it seems, complaints about skin “forgeries” or “fraud” were made to the Emperor.

Here I investigate the possibility of a hedgehog-skin-industry in Roman times. How and where were the animals found? Were they sold on markets and by whom? Did specialised supply chains exist?

How were the skins used? Why were they used instead of metal or bone tools or even thistles?

How can the “forged” skins (or “frauds”) be explained? Did a possible over-exploitation led to (local) extinctions? Were other animals or species of hedgehogs used - or vegetal elements like thorns or thistles?

As hedgehogs are nowadays bred in captivity, and have been introduced to numerous islands and regions, we also investigate the possibility of a domestication by the Romans. This could have occurred for example after local extinctions or to ensure the stability of the supply.

Historical and archaeological data are scarce on these subjects: skins rarely preserve and archaeozoological findings are rare. I use an interdisciplinary approach, combining archaeology, history, ethnozoology and ethology/ecology, to construct different hypotheses and models about humans-hedgehog relations in Roman times.

110 BEYOND CAVE ARCHAEOLOGY: INTERDISCIPLINARY APPROACHES TO HUMAN-CAVE INTERACTION IN EUROPE

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Trimmis, Konstantinos (Department of Anthropology and Archaeology, University of Bristol) - Machause López, Sonia (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València) - Skeates, Robin (Department of Archaeology, Durham University)

**Format:** Regular session

Several major publications over the last decade, such ‘Caves in Context’ (2011), ‘Sacred Darkness’ (2012), ‘The Archaeology of Darkness’ (2016) and ‘Between Worlds’ (2019), have all highlighted the cultural significance of subterranean natural spaces for human societies across diverse regions and periods. Indeed, human groups have frequently occupied selected natural cavities throughout Europe, from prehistory right up to the present day, for a variety of reasons.

This session aims to capitalise on this recent progress made by archaeologists in interpreting caves and to help set the agenda for the study of the human-cave interactions for the third decade of the 21st century. The scope is to go beyond the established norms of Cave Archaeology and to bring together provocative new theories on human-cave interaction with cutting-edge methodological and technical applications for the study of subterranean environments. We particularly welcome ideas that incorporate current theoretical perspectives (e.g. on their sensorial dimensions of caves and their landscapes, their affordances, their ritualization, the multiple uses of these natural spaces and so on), with new methodologies for the study of caves and of the cultural remains found within them (e.g. computational modelling, terrestrial and geophysical survey, creative narratives, performance studies, bio-chemical and bio-engineering approaches, amongst others). The session is not restricted to these topics; it is open to any provocative, novel, and experimental way to study the underworld beyond traditional archaeological approaches.

ABSTRACTS

1 CAVES AGAINST THE FASCISM

**Abstract author(s):** Ayán, Xurxo (Instituto de História Contemporânea, Faculdade de Ciencias Sociais e Humanas, Universidade Nova de Lisboa) - Coelho, Rui (Faculdade de Letras, Universidade de Lisboa)

**Abstract format:** Oral

Caves are part of the collective imaginary of archaeologists. They are always linked to the emergence of art in prehistory or to the daily life of our Homo ancestors. It is a comfortable past, easy to disseminate and socialize in the present. However, in many cases, these caves take us into the bowels of a traumatic, terrifying, uncomfortable past. Our experience in Conflict Archaeology has led us to document the most varied war materialities: trenches, battlefields, concentration camps, bunkers ... but also caves, used as a refuge, as hospitals or even cemeteries. In our communication we will show the role played by three caves in the armed resistance against Italian fascism. The first one is the cave of Altamira (Cantabria, Spain), a World Heritage Site. In August 1937 it was part of the Republican defensive line against the advance of the Francoist army, supported by Hitler and Mussolini. The second example takes us to the Ethiopian highlands, to the Zeret cave, in the Shoa region. In April 1939 the cave was attacked with mustard gas by the Italians. The massacre ended the lives of the elderly, women and children, relatives of the Abyssinian anti-fascist guerrillas. The third and final case takes us to the west of Croatia, to Mount Jabornica, where since 2019 we have developed the Drežnica project: Tragovi i sjećanja / Traces and Memories 1941-1945. In the vicinity of the hospital No. 7 partisan women attended in a cave the seriously wounded guerrillas, to protect them from German and Italian bombing. The interior of the cave is preserved as it has since. Our sensory and perceptual experience within it changes our archaeological vision of 2nd World War.

2 HAUNTED, SUBLIME, UNCANNY AND ABJECT: HUMAN CAVE ENCOUNTERS AND THE ROOTS OF HUMAN SUBJECTIVITY

**Abstract author(s):** Mlekuž Vrhovnik, Dimitrij (University of Ljubljana; Institute for the Protection of the Cultural Heritage of Slovenia)

**Abstract format:** Oral

The paper approaches the embodied and material dimensions of human subjectivity through exploring the human encounters with caves through concepts of affect, emotion, body, materiality, performance and practice. This approach explores how through pre-personal relations between material bodies, things and places combine to form affective fields. These visceral engagements constitute a background within which the cave is apprehended. But there is always an excess. This affective atmosphere in the cave can be described as “haunting”. Haunting is something attached to a place, it speaks of the sense of uneasiness. This unease can be described in different ways, using interrelated concepts of uncanny, sublime or abject. All revolve around the theme of boundary-blurring, destabilisation breakdown and destruction of boundaries and concepts, make the world intelligible and meaningful.

The subject, constructed in a process of creating the meaning of the world, through representations, is constantly faced by abjection. Abject refers to the raw vitality of material, to the powers of the earth, the meaningless chaotic nature, sublime non-human powers, the meaningless otherness which haunts caves and threatens the symbolic order and culture. Performances and representations emerge as ways of approaching the experience of ultimate alterity, erosion of certainty. Notions of sacred, numinous are ways of approaching the uncanny, sublime or abject. The subject is born out of a traumatic event of an encounter with the haunted, that makes it yearn for a return to someplace before entering into the symbolic order. Human subjectivity is something that emerges as the effect of the symbolic order, constituting a break from the immediate encounter with the ultimate other.

In the end, can archaeology contribute to the questions of subjectivity? How can be located within the current landscape dominated by neuroscience on one hand and psychoanalysis on the other?

3 CAVES IN ACTION: UNDERSTANDING THE NON-FUNERARY ARCHAEOLOGY OF NEOLITHIC CAVES

**Abstract author(s):** Peterson, Rick (University of Central Lancashire)

**Abstract format:** Oral

Post-humanist and new materialist theoretical approaches have been influential in recent studies of cave archaeology (Mlekuz 2011; Bjerck 2012). In a British and Irish prehistoric context these ideas have been most consistently applied to studies of funerary practice (Dowd 2015; Leach 2016; Peterson 2019). In the particular case of the British Neolithic, caves and their affordances can be seen as one of the agents involved in the differing way that the intermediary period is played out in multi-stage burial. However, there are substantial assemblages of artefacts and faunal remains from Neolithic cave sites in Britain which can be shown not to have been deposited as part of any funeral rite. For example, at Sewell's Cave, North Yorkshire, which has evidence for burial practice in the early 4th millennium BC, there is also a substantial and much later Peterborough Ware assemblage. There are also important cave sites with faunal and artefactual assemblages which have not produced any Neolithic human remains. Hearning Wood Bone Cave, Cumbria has a large faunal assemblage, included cut-marked bone dated to the Early Neolithic. Caves were clearly meaningful places in other ways than as burial spaces in this period. Post-humanist approaches to the funerary archaeology of these caves has shown that a network of actors were likely to have been in play. Caves were not the passive backdrop of human depositional practices, these assemblages need to be studied as the result of the interplay of the taphonomy of biological decay, the affordances of



	the cave space and sediments, and the actions of the humans and animals involved.
4	<p><b>WHAT ABOUT ROCK-HEWN CAVES? THEORETICAL AND METHODOLOGICAL APPROACHES TO THE ART OF CARVING</b></p> <p><b>Abstract author(s):</b> Sciuto, Claudia (University of Pisa) - Lamesa, Anaïs (DIM-Map/CNRS) - Porqueddu, Marie-Elise (Universidad Autónoma de Madrid)</p> <p><b>Abstract format:</b> Oral</p> <p>Since prehistory humans have been settling in underground shelters, often readjusting the rocky walls through carving. Bedrocks and natural cavities have been modeled by humans in order to forge organised hypogeous spaces, used for living or for ritual purposes.</p> <p>Across Europe and the entire world, the custom of carving underground chambers can be traced through the centuries and is still an ongoing practice in certain societies.</p> <p>Rock-hewn sites represent chiseled traces of past underground practices. A close reading of the rough rock surface can disclose information about economic dynamics, technological advances or changes, ways of living and symbolic beliefs of the societies by which those spaces were used.</p> <p>Our communication aims at investigating the intricate network of connection of humans and bedrock in rock-hewn structures, by applying an interdisciplinary approach, involving archaeology of techniques, experimental archaeology, geology and archaeometry.</p> <p>Drawing upon various case studies from sites situated in Italy, France, Ethiopia and Turkey, we will discuss how new materialistic and cognitive archaeology theoretical frameworks seem to be more suitable to tackle the interaction of humans and rock-hewn spaces and how digital tools (such as photogrammetry and Virtual Reality) seem to be indispensable for documenting the complex topography of rock-hewn structures.</p>
5	<p><b>EMBODIED ART AND THE SENSORY EXPERIENCE OF PALAEOLITHIC CAVES</b></p> <p><b>Abstract author(s):</b> Oosterwijk, Barbara (Durham University)</p> <p><b>Abstract format:</b> Oral</p> <p>Red silhouettes of hands, small finger dots sprinkled over a ceiling or mouth-projected disks on a wall. The earliest examples of Palaeolithic cave paintings are non-figurative and display a clear connection to the human body, both visually and in their production mode. They can be characterized, innovatively, as embodied art. Early humans explored caves with their hands and fingers and this sensory experience likely influenced their choices for selecting locations. By leaving behind markings of their own bodies they gave their surroundings meaning.</p> <p>In this presentation I will explore the sensory experience behind the creation of embodied art and how the concept of liminality can shed light on their meaning. I will discuss my approach by using examples from my research in Northern Spain, examining what placement and visibility can tell us about the images. Additionally, this presentation will discuss the results of experimental research on disk-projection to further understand the chaîne opératoire of this specific category of embodied art. A pilot-study at El Castillo cave using 3D-modelling and colour enhancement filters (DStretch) revealed that in the deepest space of the cave, mouth-projected disks are often framed by the natural shape of the rock. These disks are often placed on formations with low visibility that are difficult to access and display a striking contrast with the natural surroundings. This contrasting placement between visible and invisible space can be related to the concept of liminality, the paintings thus serving as liminal agents (Westerdahl 2005). The results from this study provide us with insights on the earliest human-cave interactions. Most importantly, it illustrates that early humans, like us, explored caves with a sense of curiosity and imagination.</p>
6	<p><b>RECORDING SENSORY DIMENSIONS OF PREHISTORIC MEDITERRANEAN CAVES</b></p> <p><b>Abstract author(s):</b> Machause López, Sonia (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València) - Trimmis, Konstantinos (Department of Anthropology and Archaeology, University of Bristol) - Skeates, Robin (Department of Archaeology, Durham University)</p> <p><b>Abstract format:</b> Oral</p> <p>Although caves are dynamic landforms that have changed over time, both physically and culturally, their characteristically sheltered interiors can be assumed to have retained aspects of their past sensoriums across prehistory and history. With the aim of achieving a better understanding of human uses and experiences of caves, we therefore consider the sensorium as an essential component. We also believe that to record and analyse their sensory dimensions in a scientific manner will complement established forms of cave archaeology data, at the same time as contributing to the broader goal of developing a methodologically more rigorous sensory archaeology.</p> <p>In this framework, we are gathering and comparing sensory archaeological data for a sample of caves from diverse prehistoric cultures, periods and regions across the Northern Mediterranean. The three currently selected caves are: Mala (Nova) Pećina in Croatia, with Early Neolithic and Early Bronze Age occupation deposits; Grotta Pila in west-central Italy, with Epigravettian occupation evidence as well as Early Bronze Age mortuary deposits; and Cueva Merinel in Spain, which developed as a key itinerary for ritual pilgrims drawn from diverse settlements during Iron Age.</p>

7	<p><b>UNDER THE SKIN OF COMMINGLED BONE ASSEMBLAGES: ELEMENT INDEX ANALYSIS AT THE COVESEA CAVES, NE SCOTLAND</b></p> <p><b>Abstract author(s):</b> Büster, Lindsey - Shaw, Daniel - Armit, Ian (University of York)</p> <p><b>Abstract format:</b> Oral</p> <p>The Covesea Caves—an enigmatic group of sea caves on the south shore of the Moray Firth in north-east Scotland—played a central role in the funerary activities of prehistoric communities in this region from at least the Early Neolithic (c. 3800 BC) to the Roman Iron Age (c. 3rd century AD). The best known of these is the Sculptor’s Cave, which has yielded over 1700 human bone fragments, together with artefact assemblages including gold covered hair-rings and other items of personal adornment. Radiocarbon dating has suggested that the commingled assemblage relates to two major periods of funerary activity in the Late Bronze Age and Roman Iron Age. Unfortunately, however, all but 150 of these bone fragments were discarded after rudimentary analysis in the late 1930s, leaving only hand-written lists of elements behind. Based on these archival records, and newly-excavated assemblages from the nearby Covesea Cave 2, this paper uses element index analysis to understand the complex and varied funerary rites which took place at the caves over their long period of use.</p>
121	<p><b>RECONSIDERING THE CHAÎNE OPÉRAIRE: RECENT DEVELOPMENTS FOR THE STUDY OF NON-LITHIC MATERIALS</b></p> <p><b>Theme:</b> 5. Theories and methods in archaeology: interactions between disciplines</p> <p><b>Organisers:</b> Porqueddu, Marie-Elise (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence) - Lamesa, Anaïs (Laboratoire des mondes sémitiques, UMR 8167, CNRS) - Sciuto, Claudia (University of Pisa, MAPPA lab) - Wild, Markus (ZBSA - Centre for Baltic and Scandinavian Archaeology; UMR 7041 ArScAn - Ethnologie préhistorique)</p> <p><b>Format:</b> Regular session</p> <p>The concept of “chaîne opératoire” was first formulated by the french anthropologist and archaeologist André Leroi-Gourhan, based on the work of Marcel Mauss on the development of an ethnographic approach to the study of techniques. From the 1970s, The chaîne opératoire became a cornerstone of the technical studies carried out in archeology particularly by lithic specialists. Although this approach has been applied to a wide range of other periods and materials (e.g. architecture or bone remains), the theoretical discussions about the chaîne opératoire and the scientific practices that accompany it, remain seemingly a domain of prehistory and lithic studies. Besides, a broad literature exists on the application of the technological approach to the understanding of various crossroads between societies and productions in anthropology and sociology.</p> <p>This session aims at re-discussing the technological approach, considering its diachronic application to different artefacts and materials. In particular, it focuses on the study of objects as a formal (standardized) language, which could be used to outline a biographical narrative of an artefact. We wish to discuss the different ways this fundamental concept is applied in general archaeology and the methodological and theoretical advances of it outside of lithic analysis. We welcome all researchers who question the chaîne opératoire-concept and its place in contemporary archaeological research through innovative and interdisciplinary approaches and who present case studies where the analyses of technological processes help to decipher the intricate network of past artefacts, environments and societies.</p>
1	<p><b>RECONSTRUCTING “CHAINES OPÉRATOIRES” OF GOLDSMITHING-JEWELLERY : ASSESSMENT AND PROSPECTS THROUGH THE PRISM OF THE NORTHERN LEVANT JEWELLERY INDUSTRY (EBA-MBA)</b></p> <p><b>Abstract author(s):</b> Laurent, Anne-Sophie (Université Paris 1 Panthéon-Sorbonne; UMR 7041 ArScAn)</p> <p><b>Abstract format:</b> Oral</p> <p>If the importance of the concept of the “chaîne opératoire” in lithic study is no longer to be demonstrated today, what about the study of goldsmith’s and jeweller’s pieces in the light of current research?</p> <p>The technological approach to these pieces is equally important in understanding the networks of exchange and transfer of ideas of past societies.</p> <p>However, studies of the entire chaîne opératoire are rare, focusing more on a particular technique than on an object in its entirety. The wider application of the concept of the chaîne opératoire to the object, however, makes it possible to study not only the tech-</p>

nique per se but the object as the realization of a set of techniques and actions.

This paper proposes to take stock of the use of this concept in goldsmithing through the example of the metal ornament of the early Bronze Age in the Northern Levant. It will also present the tools for analysing technological processes, thus enabling us to propose hypotheses from the gestures made by the goldsmith to wearing the artefact and thus to sketch out a true biographical account of the object of metal ornament.

2 PIGMENT PRODUCTION AS THE MATERIALISATION OF COLOUR

**Abstract author(s):** Kostomitsopoulou Marketou, Ariadne (Department of Archaeology, Conservation and History, University of Oslo)

**Abstract format:** Oral

Western science and philosophy have a long history of “de-materialising” colour. Based on Newtonian physics, colour is not considered a primary property of the materials surrounding us; rather, colour is perceived as the subjective sensation of light as detected by the eye and interpreted by the human brain. However, “things” have diachronically been categorised based on their colour, while certain materials, such as precious stones or coloured glass, have been valued exactly due to their outstanding colours. The technological processes involved in the production of colourants, i.e. the materials used to colour things, pigments or dyes, are here viewed as the intentional manipulation of matter for the exploitation of its colour properties: the materialisation of colour.

This paper aims to approach the materialisation of colour through the multidisciplinary study of the materials remains of pigment production from the 1st c. BCE workshop of Kos. Pigments are here approached as artefacts, the final product of a series of complicated technological processes. The operational sequences (chaîne opératoire) involved in the production of pigments can illustrate the choices of ancient craftspeople on the selection of raw materials and treatments to achieve the desired hues, reflecting their perception of colour.

However, pigments are rarely viewed as artefacts per se. The initial product, the pigment lump, undergoes a series of transformations before becoming a paint layer on a polychrome sculpture, the blue background of a fresco painting, or the red of a lipstick. The stage of pigment production is therefore only the first chapter of a pigment’s biography. As is often the case with people, the first chapters of our lives might be the most significant in what we finally become. Studies on production may thus determine the value, intended uses and perception of pigments in the past, illustrating the relationship of people with colour.

3 TERRA SIGILLATA, AN OPERATIONAL FIL ROUGE

**Abstract author(s):** La Rosa, Lorenza (University of Oslo)

**Abstract format:** Oral

In Roman archaeology, pottery has been traditionally used as a tool to define precise chronologies. This approach, useful indeed, has been biasing and conditioning our perception of the material itself, viewed as a single piece in a progressive development through time. Typological changes like the ones occurring from black slip-ware to red; or from big spiked amphorae to little and flat-bottomed ones are considered events in a linear step-by-step evolution.

By broadening from the single item to the entire technological and productive context, including the natural resources and their potential from a cultural and technological perspective, a multitude of new paths unravels suddenly.

In my paper, I will illustrate the “chaîne opératoire” of a red slip tableware, terra sigillata italica, as the unique result of ongoing choices dictated both by aesthetic and practical needs like the type of kiln, the fuel, the firing temperature, and the clay available. This stand-point becomes particularly relevant if we consider the peculiarities of this pottery type: its glossy and coral red surface is strictly dependent on an oxidation firing technique and high temperature sintering, whilst its huge commercial success relies on – and, at the same time, might be a reason for – a high standardization of practices and shapes.

4 CHAÎNE OPÉRATOIRE, COMMUNITIES OF PRACTICE, AND POTTERY IN THE PRECOLONIAL NORTHERN CARIBBEAN; A GOOD MATCH?

**Abstract author(s):** Graves, Devon (Leiden University)

**Abstract format:** Oral

Pottery is the most ubiquitous material remain recovered from Caribbean post-Saladoid contexts. However, until recently much of the research on archaeological ceramics has focused on the outward appearance of stylistic attributes, while neglecting ceramic technology. The peoples living in the areas of Hispaniola (Dominican Republic and Haiti) and the Turks & Caicos Islands have been theorized to have been in frequent and sustained contact based from a combination of modal stylistic analysis conducted on ceramics found. This research explores both the technological and stylistic attributes of pottery recovered from precolonial sites in the coastal regions of the Montecristi and Puerto Plata provinces (Dominican Republic), and the site of Palmetto Junction (Providenciales, Turks & Caicos Islands).

The concept of the chaîne opératoire was utilized in this research in conjunction with the theory of communities of practice in order to better understand the manufacturing techniques employed in the production of pottery in these regions. The combination of technique and theory can allow to delve further into the social dimension of pottery production and the possible relationship and exchange networks that took place between potters or the communities in which they were made or traded. Macrofabric, macrotrace,

and modal stylistic analyses of the recovered sherds were employed to explore the processes of making. It was found following the chaîne opératoire approach that potters engaged in a complex interplay of production utilizing a multiplicity of techniques and outward design. It was also found that the use of both communities of practice as a theory and chaîne opératoire as an approach work for certain case studies, but not for others. Several scenarios were unfolded about the possible relationship between the different potting communities and sites analyzed and adds to the current narrative and understanding of the Late Ceramic Age Northern Caribbean.

5 TACKLING BUILDING FEATURES AND SOCIALISING THE CHAÎNE OPÉRATOIRE: THE CASE OF NEOLITHIC KLEITOS 2 IN NORTHWESTERN GREECE

**Abstract author(s):** Kalogiropoulou, Evanthia - Kloukinas, Dimitris - Kotsakis, Konstantinos (Aristotle University of Thessaloniki)

**Abstract format:** Oral

The concept of chaîne opératoire has been successfully employed in the analysis of various material culture categories. In the case of building remains and cooking installations, however, its application is not straightforward. Domestic structures are complex artefacts entailing numerous building and tempering materials, as well as a wide range of reductive, transformative and additive processes that stem from and reflect continuous changeable and social developments, experimentation and transformation practices. These processes are not always organised in a strict sequential order.

Additional to technological information, architecture offers a window to past behaviours, routine practices and lifeways. Chaîne opératoire of architecture and domestic structures, however, has not contributed much into the social context of their technology. Our approach focuses on the employment of a flexible chaîne opératoire that provides a useful methodological tool for the description and interpretation of technological and social processes. We incorporate the concept of taskscape, introduced by the anthropologist Tim Ingold, that enriches the insights provided by referring to the totality of the intertwined activities or tasks taking place within a landscape. The construction of earthen structures, constitute taskscapes of coexistence, routine interactions and daily mutual tasks that form and transform people’s social identities and status. Therefore, the concept of taskcape fits well with the analysis of different sequences of activities within diverse spatio-temporal surroundings.

Through a local-scale analysis of earthen architectural features from the Late/Final Neolithic settlement of Kleitos 2 (Kozani, Greece), this paper reconsiders the concept of chaîne opératoire and broadens up the discussion of current theoretical and methodological approaches. Its objective is to challenge the ‘managerial’ aspects of the concept which underplay the social implications of technological developments, practices and processes. The paper suggests an integrated analysis of diverse theoretical and methodological schemes that might gear best with the current pluralism of archaeological information.

6 THE CHAÎNE OPÉRATOIRE AS A TOOL IN INTERPRETING THE ROCK-CUT TOMBS IN THE MEDITERRANEAN NEOLITHIC

**Abstract author(s):** Porqueddu, Marie-Elise (Economia y sociedad en la Prehistoria de Madrid, Universidad Autonoma de Madrid; Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence)

**Abstract format:** Oral

Rock-cut tombs and hypogea are well known for the western Mediterranean Neolithic. Different aspects are currently discussed such as chronology and cultural attribution. Nevertheless, their construction remains poorly examined. The chaîne opératoire can be a method to understand the construction of rock-cut tombs. It allows to approach the architecture in its entirety, from the shape to the techniques and tools involved in the construction. In this communication, we will demonstrate how the chaîne opératoire allows to better understand the building of rock-cut tombs in the South of France, with the Fontvieille necropolis and the hypogea of Sardinia. Beyond a strictly technological approach, we will also discuss the chaîne opératoire as an interpretation tool. The chaîne opératoire offers a perfect tool for a comparative method between these architectures. It gives objective elements to analyse and to confront. The chaîne opératoire permits to sum up the strategies which took place during the construction of rock-cut tombs and to study it at a large scale such as the western Mediterranean. It allowed us a better understanding of the whys and wherefores of this particular architecture, as well as a better understanding of those prehistoric societies.

7 THE TRANSFIGURATION OF ANTIQUITAS. A TECHNOLOGICAL APPROACH TO THE STUDY OF SPOLIA

**Abstract author(s):** Sciuto, Claudia (University of Pisa- MAPPA Lab)

**Abstract format:** Oral

With the term spolia scholars usually indicate reused building materials found in secondary architectural settings. In Europe, the use of “second hand” building materials is well documented, and particular attention has been given to the study of Greek or Roman elements embedded in late antique or medieval constructions. The study of spolia became particularly popular during the 80ies and the 90ies amongst archaeologists and art historians, who approached the study of residual architectural elements focusing on iconographical and epigraphical evidences. Spolia have been generally examined as enduring traces of antiquitas inserted in later architectural palimpsests, carrying a symbolic meaning and linked to power display.

This contribution aims at taking a closer look at Roman spolia, considering them both as markers of ancient urbanism as well as material constituents of the late antique/medieval construction sites. This is achieved by applying a technological approach to the

characterization of all the steps of the chaîne opératoire: from procurement to transformation and application of reused building materials.

Examples will be drawn from the city of Pisa (Italy) and the project “the invisible cities” that aims at mapping the transformation of the urban landscape by combining archaeology of architecture, geochemical analysis of building materials and spatial modelling through GIS. Provenience, type of stone and formal characteristics of the elements have been taken into consideration when creating a database for storing information collected in the field. In particular, an accurate choice of ontologies helped pinpointing particular stages in the life of artefacts, highlighting the agencies of materials, constructors and commissioners in the transformation of the urban space between the Roman period and the Middle Ages.

8 **HOW TO HEW A ROCK-HEWN COLUMN? APPLYING THE CONCEPT OF ‘CHAÎNE OPÉRATOIRE’ TO STUDY THE CHURCHES WORKSITES IN CAPPADOCIA (TURKEY)**

**Abstract author(s):** Lamesa, Anaïs (DIM-Map/CNRS Orient & Méditerranée; IFEA)

**Abstract format:** Oral

In order to discuss the concept of the ‘chaîne opératoire’, its application and limits in the study of rock monument worksites, I will consider the hewing process of a column.

Between 2007 and 2013, I had the opportunity to study rock-hewn techniques and worksite organisation for thirty churches dated between the 7th and 11th centuries. During this research, I observed two different technical processes for hewing a column on the site of Soğanlı (Cappadocia, Turkey).

The first process can be observed in a church, most probably dated to the end of the 10th century, Tokalı kilise, where a column delimiting the south-west compartment was abandoned during the hewing phase.

The second case study, Gök Kilise church, not far from the first, is also dated to the 10th century. Only the colonnade that separates the nave in two seems to be abandoned.

First, I propose to analyse these two technical processes by a traceological study. This allows me to shed a light on the ‘chaîne opératoire’ and its variations.

Once this first analysis has been carried out, it seems to me necessary to contextualise these ‘chaînes opératoires’ and to put them into perspective through the contribution of ethnoarchaeology and geology. Indeed, as the ethnologist H. Balfet pointed out in 1991, the concept of ‘chaîne opératoire’ is a tool that reveals a technical process and helps to analyse the facts. For archaeologists, the concept of ‘chaîne opératoire’ is useful to understand studying societies.

I think that the concept of ‘chaîne opératoire’ needs to be put into perspective with input from other disciplines. In the case of rock-hewn monument worksites, ethnoarchaeology and geology are the most relevant.

124 **ARCHAEOLOGY OF SOUNDSCAPES AND SOUNDSCAPES FOR ARCHAEOLOGY**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Díaz-Andreu, Margarita (Institució Catalana de Recerca i Estudis Avançats - ICREA; Universitat de Barcelona) - Till, Rupert (University of Huddersfield) - Jiménez-Pasaolodos, Raquel (Universidad de Valladolid; Universitat de Barcelona)

**Format:** Regular session

Soundscapes – both natural and human – are an important study for those interested in the past. Ethnomusicologists have shown that soundscapes can shape cultural knowledge, including not only musical aesthetics and symbolic meanings associated with sound, but also religious beliefs, memories, emotions, and even social behaviours. In natural landscapes, human beings are surrounded by a rich sonic cosmos in which to create, reinforce, or contest their world views. Moreover, anthropic soundscapes delineate human cultures and are able to mark time, frame ritual contexts, establish borders in the landscape, reinforce or separate cultural identities, and even define sacredness, power, and prestige. Music archaeology and archaeoacoustics have laid the methodological basis for reflecting on the possibilities of unveiling past anthropic soundscapes and musical and acoustic behaviours, as well as the relations of these with both ecology and culture.

For this session, we welcome proposals that reflect on the importance of soundscapes in past and present cultures and examine different methodological and theoretical approaches to the study and reconstruction of past soundscapes through for example archaeoacoustics, archaeological finds, iconographies, written sources and ethnographic comparisons. We also encourage discussions about ancient musical instruments and their relation to both natural sounds and acoustics, along with their presence in anthropic soundscapes. Presentations on projects dealing with the use of sounds, music or reconstructed soundscapes in the dissemination of archaeological heritage will be also welcomed. In particular, we would like to receive proposals for papers that reflect on the possibilities of enhancing the experiences and involvement of visitors to archaeological contexts through sound. Finally, we also invite ethnomusicologists to share their reflections on the interactions of soundscapes and culture, such as the presence of acoustic phenomena in myths, the use of particular acoustic conditions in rituals, or the creation of ritual soundscapes.

**ABSTRACTS**

1 **THE ARCHAEOACOUSTICS OF THE EBA MESOPOTAMIAN FUNERARY PRACTICES**

**Abstract author(s):** Calabrese, Agata Maria Catena (The University of Sydney)

**Abstract format:** Oral

The funerary arena in Early Bronze Age Mesopotamian society involved many different sensory experiences, among these: visibility, movements, smells and sounds played a major role. The archaeological sites of Mari and Ugarit show rich evidences of a music culture associated with the mortuary sphere during the Bronze Age but currently little is known about the social impacts of these performances. This paper will employ GIS in exploring the experiential aspects of the burial process in Early Bronze Age Mesopotamia with a particular attention to sound experiences. To examine the potential impact of vocal/musical sounds a Digital Elevation Model (DEM) of the past landscape was developed and the ‘System for the Prediction of Acoustic Detectability’ (SPreAD-GIS) was used to predict the impact of sounds on the EBA archaeological sites. The results of this study suggest that music and vocal sounds had a strong impact within the mortuary sphere and beyond, with important social and political mnemonic consequences.

2 **THE SOUND OF ANCIENT EGYPT**

**Abstract author(s):** Köpp-Junk, Heidi (University of Trier)

**Abstract format:** Oral

Various studies have been carried out to analyze the sound in large caves and other localities. Sound archaeology and acoustics are fields of research that have not previously been investigated in Egyptology. The lecture focusses on the relation of sounds and acoustics, instruments and musical activities like hand clapping and singing, and the localities where the musical performances took place and analyzes Iconographical, archaeological and textual sources.

It is to assume that the phenomenon of sound and acoustics was known in Ancient Egypt and that musical performances took place at certain places within a temple or a locality, where the acoustics were optimal. From the Old Kingdom onwards performances inside and outside of buildings are documented in Ancient Egypt (open air, in tents, in rooms). In rooms, the sound distribution and the acoustics are better than in an open air performance, making it easier for the musician to play in front of a large audience. Therefore, the architectural acoustics in private homes were different from those in Egyptian rock tombs, funerary chapels, funerary enclosures, or temples. It would be useful to analyze whether the development of the temple architecture is connected to the development of religious practices including music.

Enclosures without a roof show different acoustics, as an impulse sound measurement in a palisade circle revealed. In addition to the acoustics inside the system, the minimization of external noise from outside through the limitation is an important factor. In this respect, acoustic investigations in Egyptian temples would certainly be as interesting as in other places where performances of religious acts took place, be it solely by voice or supported by musical instruments or actions like hand clapping, as the Early Dynastic funerary enclosures in Abydos or the like.

3 **SOUNDSCAPES AND MUSIC IN GREEK TRAGEDY. AESCHYLUS’ AND SOPHOCLES’ WORKS**

**Abstract author(s):** Panosa Domingo, Maria Isabel (Universitat de Lleida)

**Abstract format:** Oral

This paper focuses on the analysis of written sources for getting systematic information about music and soundscapes in ancient Greece. The definition and classification of data is contrasted with contemporary iconographic references, archaeological finds and architectural spaces with appropriate acoustic conditions for sound propagation.

The background for sound production in Hellenic culture, especially in drama, is largely provided by nature and the phenomena triggered by the four elements, which became instruments in the hands of divine plans, as we can see in Greek mythology and the world view of ancient Greeks. Besides, there is human nature, which is revealed not only through the dramatic action itself, but also through the expression of pain, emotions and passions by its characters. In tragedies, these references are used as highlights within the narrative line and a resource for creating images or evoking soundscapes. Moreover, based on the Pythagorean conception, the universe would also have a sound translation in music as reflection of the harmony of the spheres. This philosophical consideration is linked to the theoretical aspects of Greek music (scales, tonoi, metric and rhythmic aspects...) and perhaps also to the choreographic materialization of certain movements conceived in an astral sense, but not always easy to elucidate from the tragic text.

This proposal analyses Aeschylus’ and Sophocles’ tragedies; in particular, the passages that suggest sound effects or indicate the use of music with a certain purpose or function, aiming to interpret the contexts of such expressions and their characteristics. Among these, although examples of other sound situations are also found, it is the sacred ceremonies and funerary rituals that occupy a privileged place. Certain soundscapes and hymns we can find in tragedies shape and reinforce the sacred frame perpetuated by the Hellenic tradition so that the community gets involved within and beyond the story.



4

DINING IN A CIRCUS: AN ACOUSTIC READING OF PETRONIUS’ COENA TRIMALCHIONIS

**Abstract author(s):** Mungari, Pasquale Mirco (Independent researcher)

**Abstract format:** Oral

In the description of a grotesque coena offered by Trimalchio to his friends and guests, Petronius stigmatises a bad habit of up-per-class Roman citizens, and in general offers to his readers a list of instructions about politeness, honesty, and moderation, through a parodic hyperbole of their contrary. Furthermore, his criticism is expressed by means of a precise description of the sound-scape: in fact, Petronius carefully depicts every sounding act that happens during the coena, giving informations about voices, instruments, music, and noises. An analysis of the whole text can give an opportunity to understand the moral consideration of sound in Petronius’ opinion, as well as reveal his strategies in descriptions of sounds, imitation of models, and amplification of real-istic scenes.The aim of this paper is to carefully examine the Latin text, to identify and classify every reference to sound, and then to give a reading of Petronius’ parody of the soundscape of a coena, made by using a precise model of reference, the ludi circenses.

5

THE KEMENÇE KARADENİZ, A SPATIOTEMPORAL MEDIUM FOR UNDERSTANDING THE MEDIEVAL “VIÈLE À ARCHET”

**Abstract author(s):** Frouin, Clément (CEMM, EA 4583, Université Paul Valéry, Montpellier)

**Abstract format:** Oral

The fact that virtually no archeological trace concerning the vièle à archet can be found has led today’s “archéoluthiers” (string in-strument makers involved in the reconstitution and reenactment of former musical traditions) to reinvent or rediscover a lost craft. We are convinced that the instrument is essential to music, implies it, and we believe that a better understanding of the vièle is vital to read deeper into the troubadour’s repertoire. To such an extent, in order to overcome archeological shortcomings and the lack of technical resources in contemporary iconography (mainly sculpture and illumination), we have set out to research instruments which belong to the same family, and have similar organological characteristics and functions (voice accompaniments). An instrument seems to complete these requirements; the kemençe karadeniz, a small vièle found by the shore of the Black Sea.

In this contribution, we argue that studying that instrument – both in terms of craftsmanship and play – can challenge our vision of the troubadour’s repertoire. Therefore, we offer to share our conclusions regarding a first research fieldtrip to Turkey, which involves showcasing a kemençe’s production and drawing organological parallels between this instrument and our medieval vièle. Moreover, we will investigate types of play and performance, especially the relationship between singing and vièle playing. Ultimately, these connections established between the medieval vièle and the kemençe karadeniz will enable a fresh outlook on statements such as: “Bien est avis, si bien vièle, que parler veille sa vièle.”(Gauthier de Coinci, The Miracles of Notre Dame).

6

THE TEOTIHUACAN SOUND MAPPING PROJECT: EXPLORING THE SONIC SPHERE OF THE CITY OF THE GODS, MEXICO

**Abstract author(s):** Both, Adje (University of Huddersfield)

**Abstract format:** Oral

The cultural remains of the UNESCO World Heritage site of Teotihuacan belong to a powerful society dominating the splendid period of Classic Mesoamerica during the first half of the first millennium CE. However, many aspects of this culture are still not well under-stood, including the role that sound and music played in its urban environment. With the aid of new technologies in geo-referenced sound mapping and multimedia applications, the musical instruments of Teotihuacan will be recreated and played, their sounds test-ed both under laboratorial conditions and on-site in different architectural settings, and a virtual sound-map of the city on the basis of the results created.This research will contribute to a better understanding of the site and the sonic interaction of its inhabitants, as will significantly develop the field of archaeoacoustical research. Funded through a Marie Curie fellowship of the European Union, the Teotihuacan Virtual Sound Map is a pilot-project for creating a model for exhibiting sound in the actual environment of ancient archaeological sites.

7

RECREATION OF CAVE SOUNDSCAPES SUITABLE FOR ANCIENT GREEK PANIC RITUALS FROM BINAURAL ROOM IMPULSE RESPONSE MEASUREMENTS

**Abstract author(s):** Yioutsos, Nektarios-Petros (Faculty of History and Archaeology, National and Kapodistrian University of Ath-ens) - Kamaris, Gavriil - Mourjopoulos, John (Department of Electrical and Computer Engineering, University of Patras)

**Abstract format:** Oral

In our research it is investigated the possible unique acoustics of caves dedicated to the worship of the goat-legged god Pan and the Nymphs in Attica, Greece. Pan and the Nymphs have special connections to sound and resonance and there seems to be a recip-ocal connection between their ritual performances and the sonic qualities of grottos. In an attempt to understand, whether sound was a determining factor in their recognition as sacred sites appropriate to this cult or not, acoustics measurements were taken in two sacred caves (cave of the Nymplept Archedimos in Vari, Lychnospilia cave on Mt. Parnitha) and in another with no evidence of ritual use (Korakovouni I on Mt. Hymettus) for comparison reasons. Two kinds of measurements were taken: using an omnidirectional mic for obtaining the acoustics parameters of caves [e.g. Reverberation Time (RT), Early Decay Time (EDT) etc.], using a binaural dum-my head to calculate binaural parameters of the acoustics and producing virtual soundscape auralizations. The latter is achieved by

combining (convolving) the Binaural Room Impulse Response measurements (BRIRs) with anechoic or pseudo anechoic audio sam-ples. In comparison to other methods like in situ recordings, this methodology gives the advantage, flexibility and freedom to create a soundscape using whatever audio sample the user has available and to realize the experience of being in the exact place. There is also the possibility to use modern recordings and investigate how they were possibly perceived in ancient ritual spaces. For the ease of the auralization, an app has been created, using Matlab and real-time convolution algorithms for auralization, which allows the user to combine the available source-receiver positions in the cave with audio samples and to listen to the results.

8

CAN YOU HEAR THE ROAR OF THE LION? UNPACKING THE SOUNDSCAPES OF (INDIGENOUS) CULT AT MUSAWWARAT ES-SUFRA, SUDAN

**Abstract author(s):** Kleinitz, Cornelia (Humboldt-Universität zu Berlin, Institut für Archäologie, AKNOA)

**Abstract format:** Oral

This paper provides an initial overview of investigations into the multi-sensory experience of (indigenous) cult, and especially its soundscape(s), in ancient Sudan. Musawwarat es-Sufra, one of the major sacral sites of the Kingdom of Kush in the Middle Nile val-ley, serves as a case study. The site boasts well-preserved sandstone architecture in form of numerous shrines and temples, among them the earliest known temple for the indigenous lion-headed god Apedemak. In addition to the buildings themselves, temple fur-niture and offering installations have been preserved together with (fragments of) associated objects. Among the latter is an iron trumpet, which may have been used in cult proceedings. This is supported by temple reliefs at Musawwarat showing what appears to be a trumpet being used. The iconography from the site includes further indication of the ancient soundscape, such as depictions of bells worn by cattle in an apparent procession. The human voice may be represented by numerous textual graffiti, many of which are invocations to the god Apedemak. They were incised in Meroitic cursive, an early sub-Saharan script that was developed (locally?) around the time the Apedemak (or Lion) Temple was built in the late 3rd century BCE. It is possible that informal writing on the temple walls was not a mute act but that it was accompanied by spoken versions of the respective invocation. Apart from drawing from the study of archaeological finds, formal and informal iconography and the relationship between writing and speech, the evaluation of the ancient soundscape related to cult at Musawwarat is also planned to include the investigation of the sound properties and af-fordances of various architectural structures and of the valley of Musawwarat itself. The presentation also includes a brief overview of approaches to the public presentation of the ancient soundscape(s) of Musawwarat.

9

SONIC RITUALS AND SOUNDSCAPES OF SACRED SITES IN FINLAND: HISTORICAL TRADITION, CONTEMPORARY PRACTICE AND ACOUSTIC MODELLING

**Abstract author(s):** Rainio, Riitta (University of Helsinki) - Hytönen-Ng, Elina (University of Eastern Finland) - Wolfe, Kristina (University of Huddersfield)

**Abstract format:** Oral

Rocks and cliffs in Finland, smoothed, cracked and heaped by the glacial ice sheet, have been assigned a special status and cultural significance through the ages. Prehistoric hunter-gatherers marked cliffs with red paintings, the indigenous Sámi venerated cliffs and boulders with offerings and Finnish witches and sorcerers of the 18-20th century regarded cliffs, boulders, gorges and caves as abodes of spirits. Today hikers and practitioners of neoshamanism and neopaganism visit the same sites to renew their energies or connection with nature. Curiously, all these traditions or activities appear to involve sonic rituals, such as drumming, singing, incant-ing, making noise or listening to the voices of spirits. This paper examines these sacred sites from the perspective of acoustics and soundscapes, hypothesizing that the ability of the rocks to reflect sound, to resound, was a crucial factor in the ritualization of the sites as well as in the formation of the sonic rituals. The acoustic properties of two exemplary sites, Ukonvuori (‘Hill of the Main God’) and Pirunkirkko (‘Devil’s Church’) in Eastern Finland, are examined by in situ impulse response measurements and acoustic modelling with the Odeon software. We use acoustic simulation to examine the role that historic changes in the water levels may have had on the acoustics and psychoacoustics of the sites. Simulation data such as T30, echo (dietsch), listener envelopment (LF80) and SPL are discussed. Related myths, beliefs and ritual practices are traced from folklore archives and given ethnomusicological anal-yses. Moreover, auditory experiences and subjective impressions of contemporary shamanic practitioners visiting these sites are examined by interviews and discursive psychology (a form of discourse analysis). The paper discusses the age-old ritual traditions in Finland in their right acoustic and environmental contexts, providing thus insight into the intimate relationship between music, acoustics, soundscape, religion and nature across the times.

10

RITUAL MUSIC AND THE CONFIGURATION OF LIMINAL SPACES: EXAMPLES FROM ARCHAEOLOGY AND ETHNOGRAPHY

**Abstract author(s):** Jiménez Pasalodos, Raquel (Universidad de Valladolid / Universitat de Barcelona) - Díaz-Andreu, Margarita (ICREA & Universitat de Barcelona)

**Abstract format:** Oral

Music has a significant role in rituals both in present and past societies, mainly as a crucial element in the emotional enhancement necessary for the perception of the ritual performance as “other than routine reality” (Bell 1997), acoustically framing ritual not only in sacred sites (i.e. sanctuaries, temples...), but also in locations where sacred material culture may or may not be present, such as domestic spaces, natural environments or in motion (i.e. parades and pilgrimages). Moreover, these ritual soundscapes configure on

their own liminal spaces where not only the boundaries between the human and the divine worlds are blurred, but also where certain strict social norms can be safely trespassed. In this paper, we will propose a theoretical approach to the presence of music in ritual through the study of archaeological and ethnographic examples where the transgression of both social and physical laws is ensured by the presence of music and its transformative experience.

11 THE ACOUSTIC ECOLOGY OF THE THE HAL SAFLIENI HYPOGEUM IN MALTA

**Abstract author(s):** Till, Rupert - Wolfe, Kristina (University of Huddersfield) - Swanson, Douglas (Unaffiliated)

**Abstract format:** Oral

The Hal Saflieni Hypogeum is a unique subterranean Maltese Neolithic sanctuary with a well-documented history of interest in its acoustics. Following a pilot study, Rupert Till and Kristina Wolfe carried out a first comprehensive acoustic survey of the World Heritage Site. A range of acoustic metrics were extracted from impulse responses that were captured using a swept sine signal measurement technique. The results provided a detailed understanding of the acoustic ecology of the Hypogeum, including long reverberation, very prominent bass resonance, a sense of envelopment, distortion of voices, stimulation of acoustic effects even by quiet sounds, and a set of individual frequency peaks that correspond to a musical scale. Analysis of the acoustic behaviour of a scanned digital model of the space confirmed the results and allowed further study. It allowed the acoustic wave equation of its geometry to be solved with the assistance of researcher Douglas Swanson, establishing that the coherent musical effect that is present throughout the monument required multiple walls to be shaped with an accuracy of 15cm or less, suggesting that the acoustic effects present could not be entirely accidental, although they could have been caused by unconscious rather than intentional processes. This presentation outlines an interdisciplinary collaborative project, providing a new level of detail in acoustic study of an archaeological site, and applying new scientific methods to the fields of archaeoacoustics and sound archaeology. This results in a detailed systematic analysis and understanding of the Hypogeum, revealing the nature of the remarkable acoustics of this unique site.

12 BINAURAL SOUND FOR AUDIO GUIDES: AN ENHANCED VISITOR’S EXPERIENCE IN MUSEUMS AND ARCHEOLOGICAL SITES

**Abstract author(s):** De Muyenke, Julien - Farran, Antoni - Garriga, Adan (Fundació Eurecat)

**Abstract format:** Oral

The project BINCI - Binaural Tools for the Creative Industries - which took place in 2017-2018 and was led by La Fundacio ‘Eurecat, aimed to develop an integrated software and hardware solution to ease the production and distribution of binaural audio content. Binaural audio refers to a specific type of audio material that offers a stunning listening experience through headphones by externalising the sound scene (out-of-head localisation), thus offering an ultra-realistic soundscape with depth and 360o panning. The tools developed for BINCI were used in particular for creating the binaural content of next-generation audio guides of three emblematic cultural sites: La Fundacio ‘Miro’ in Barcelona, Die Alte Pinakothek in Munich, and St Andrews Castle. This paper will focus on the latter case.

On site, the visitor had at his disposal an audio guide embedding a binaural player plus a headset equipped with a head-tracker. The head-tracker is a small electronic device that tracks in real time the rotational movements of the user’s head. This information is exploited to rotate the 3D sound scene accordingly, so that it remains steady no matter of the user’s head movements. In order to further accentuate the realism of the storytelling, we have carried out acoustic measurements aiming at capturing the peculiar reverberation of the different places the visitor is taken to (guard chamber, underground tunnel, well etc.). These reverberation data were later used to confer to the narrator’s voice and ambient sounds the specific acoustic signature of the rooms where the visitor is standing.

All this gave rise to very realistic sound scenery, as if it were really taking place around the listener, in a similar fashion to Virtual Reality experiences. Opinion polls showed that the use of binaural sound enhanced the visitor’s experience by immersing him into the storytelling.

127 RECENT ADVANCES IN THE ARCHAEOLOGY OF HUMAN-REINDEER INTERACTION [PAM]

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Salmi, Anna-Kaisa - van den Berg, Mathilde - Niinimäki, Sirpa (University of Oulu) - Aronsson, Kjell-Åke (Åjtte, Swedish Mountain and Sami Museum) - Piezonka, Henny (Kiel University)

**Format:** Regular session

Reindeer (Rangifer tarandus) have been central in the livelihoods and cosmologies of many peoples from the Pleistocene to present day. They have been prey to hunters living on the periglacial steppes of Ice Age Europe, in the tundra and taiga of Prehistoric Northern Eurasia and North America, and have remained an important game species in subarctic regions of the Northern hemisphere up until today. Domesticated reindeer have been herded as a means of food production, transport and ideological expression in many Eurasian circumpolar societies at least since the Iron Age and have recently been introduced to other parts of the world. Unique for husbanded animals, however, they lack clear expressions of the ‘domestication syndrome’ which is why some researchers see them as semi-domesticated as they have retained their freedom to a greater degree than many other domesticates. The reindeer

escapes definitions and categorizations due to its morphological and behavioral plasticity across a variety of arctic and subarctic environments and the variety of cultural adaptations of the people engaging with the reindeer. For instance, people largely follow the migrations of the tundra reindeer herds, whereas in the taiga, complex mechanisms of niche construction (fish feeding, smoke against insects) are used to attach the reindeer to the human settlements. Recent advances in biomolecular archaeology, geoarchaeology, zooarchaeology, and the anthropology of reindeer using communities have opened new possibilities for researchers. This session focuses on how these new approaches can help further our understanding of the interaction between people and reindeer and its economic, sociocultural and ideological implications. The papers will focus on, for instance, the many variations of reindeer herding, reindeer in worldview and cosmology, the dichotomy of hunting vs. herding reindeer, and the effects of environment and climate on human-reindeer systems.

ABSTRACTS

1 EMORPHPROJECT: RECONSTRUCTING HABITAT TYPE AND MOBILITY PATTERNS OF RANGIFER TARANDUS DURING THE LATE PLEISTOCENE IN SOUTHWESTERN FRANCE: AN ECOMORPHOLOGICAL STUDY

**Abstract author(s):** Galán López, Ana Belén (CNRS-UMR5608 TRACES, Univ. Toulouse Jean Jaurès; Université de Montréal) - Costamagno, Sandrine (CNRS-UMR5608 TRACES, Univ. Toulouse Jean Jaurès) - Burke, Ariane (Université de Montréal)

**Abstract format:** Oral

Reindeer (Rangifer tarandus) played an important role in human subsistence during the Palaeolithic in Western and Central Europe. Many archaeological studies have focused on reindeer predation during the Magdalenian, in particular, and the link between reindeer migration and human mobility. However, despite numerous attempts to reconstruct the migratory behaviour of Palaeolithic reindeer herds, there is not yet a clear a model of their movements.

Modern ethological data indicates that reindeer herds adopt different mobility strategies that correlate with habitat type and topography. The mobility patterns of prehistoric reindeer, therefore, should be predictable if palaeoenvironmental reconstructions can identify whether or not they lived in more open or more wooded environments. Vegetation reconstructions on a regional scale are not straightforward, however, and the response of modern herds to mosaic habitats is variable. An animal’s habitat and mobility patterns hypothetically affect bone density and limb bone morphometry, however, as has been proven in several species.

Therefore, the aim of the Emorph Project is to quantify the link between habitat type, mobility and bone density and morphology using modern caribou populations thought the use of Computer Tomography (CT), Geometric Morphometric methods (GMM) and traditional morphometry. These tools will allow us to identify whether or not it is possible to determine how mobile prehistoric herds were, and or what type of habitat they lived in. The goal is to create a referential framework that can be applied to faunal assemblages from Upper Palaeolithic archaeological sites in Southwestern France and used to reconstruct prey mobility and human hunting strategies.

2 PATHOLOGICAL PECULIARITIES BETWEEN MODERN ECOTYPES OF FENNOSCANDIAN REINDEER: INJURY PATTERNS AND IMPLICATIONS FOR DOMESTICATION AND PALEOECOLOGY STUDIES

**Abstract author(s):** Hull, Emily (University of Alberta) - Puolakka, Hanna-Leena (University of Oulu) - Semeniuk, Mitchell (University of Alberta)

**Abstract format:** Oral

The variety of relationships between humans and Rangifer tarandus in Fennoscandia are of interest to both zooarchaeologists and scholars of human-animal studies. Two subspecies of Rangifer tarandus are native to Fennoscandia. One of these, the tundra, or barrenground, reindeer ecotype R.t. tarandus, has been domesticated, while the boreal, or forest, ecotype R.t. fennicus has been hunted by humans but is not domesticated. Our study examines whether patterns of pathological lesions related to age, activity, and trauma in modern Finnish reindeer differ significantly between R.t. tarandus and R.t. fennicus. Because these ecotypes exhibit somewhat distinct behaviors and inhabit different environments, we explore whether these disparities affect the skeleton enough to create consistent patterns of pathological lesions. Additionally, both divisions in pathologies by sex, as well as an out-group of Rangifer tarandus of multiple wild ecotypes from Canada have been assessed for comparison. The patterns in lesions unique to each ecotype can be used to assess archaeological assemblages, potentially providing information about herding, hunting, and husbandry of reindeer in the past.

3 REINDEER LONG BONE CROSS-SECTIONAL PROPERTIES AS INDICATORS OF PHYSICAL ACTIVITY

**Abstract author(s):** Niinimäki, Sirpa - Pelletier, Maxime (University of Oulu) - Härkönen, Laura (Natural Resources Institute Finland, Oulu) - Puolakka, Hanna-Leena - van den Berg, Mathilde - Salmi, Anna-Kaisa (University of Oulu)

**Abstract format:** Oral

The initial phases of reindeer domestication are difficult to identify in archaeological record. However, the earliest contacts between human and reindeer are reflected in reindeer activity, such as feeding patterns (feeding versus digging for lichen in winter), restricted mobility (corralling), or intensified activity (draught). Those differences may reflect in cortical bone distribution as bones strengthen towards usual direction of stress via bone functional adaptation.



Activity-related changes were identified among contemporary reindeer. Our material are wild forest reindeer and semi-domesticated reindeer, including free-ranging, working (racing or draught) and zoo reindeer of Northern and North-East Finland. Total of six different bone elements were scanned with pQCT (Stratec XCT Research SA+) to obtain information of bone strength and shape. Bone variables of working and zoo reindeer were compared to wild/free-ranging using linear mixed effects models. Variations in size and shape of cortical bone were quantified using a 2D geometric morphometrics approach.

Working reindeer had greater bone strength compared to free-ranging reindeer in humerus, radioulna, femur and tibia, reflecting greater strength requirements in their activity. In addition, humerus and femur cortical bone areas were greater among zoo reindeer compared to free-ranging reindeer, likely reflecting greater axial loading due to less active lifestyle of zoo reindeer. In bone shape, working reindeer and zoo reindeer had more mediolaterally oriented humeral and radioulnar midshafts compared to free-ranging reindeer, which likely results from differences in feeding behavior. Metapodial shapes of zoo reindeer were more mediolaterally oriented compared to free-ranging reindeer, which may result from the sedentary lifestyle of zoo reindeer. Tibial midshaft was more mediolaterally oriented in working reindeer compared to free-ranging reindeer, likely reflecting requirement for forward propelling motion among working reindeer.

The results of this study are encouraging and should allow identifying reindeer domestication status via observation of activity-induced patterns in bone elements from archaeological material.

4 **WHAT ABOUT RUDOLPH? IDENTIFYING CASTRATED REINDEER BONES TO TRACE REINDEER DOMESTICATION IN FENNOSCANDIA**

**Abstract author(s):** van den Berg, Mathilde (University of Oulu) - Wallen, Henri (Univeristy of Oulu; Arctic Centre - University of Lapland) - Salmi, Anna-Kaisa (University of Oulu)

**Abstract format:** Oral

Knowledge of the processes surrounding reindeer (*Rangifer tarandus*) domestication can give insight in the history of many past and contemporary circumpolar cultures. However, the time and origin of reindeer domestication remains hotly debated today. Determining the domestication status of reindeer in archaeological bone assemblages is problematic because wild and semi-domesticated reindeer are morphologically very similar. Many argue that castrated males were probably the key to reindeer domestication. Although the importance of castrates and their part in incipient reindeer domestication is widely recognized, no methods exist that can discern a reindeer gelding from a reindeer bull. We focus on the use of castrated reindeer and define the osteological manifestations of reindeer castration. This is a new approach to document human intervention in the population structure of this species. The premise of this method is that castration delays epiphyseal fusion and thus allows the elongation of the bones, and long bones in particular. For this study we measure reindeer bones of known age, sex, castration status, and subspecies extant in Fennoscandia before the 19th century to plot the osteometric differences between the categories. Here I present our findings on the front limb bones, hind limb bones, and the pelvis. The outcomes of this research aids in evaluating a novel method of tracing (incipient) domestication also for other species.

5 **UNRAVELLING SYMBIOTIC RELATIONSHIPS: A NEW PERSPECTIVE ON HUMAN-REINDEER SYSTEMS IN WESTERN SIBERIA**

**Abstract author(s):** Windle, Morgan - Piezonka, Henny - Makarewicz, Cheryl (Institut fuer Ur- und Fruehgeschichte Kiel)

**Abstract format:** Oral

*Rangifer tarandus* play a unique role in circumpolar subsistence and symbolic systems around the globe. This is particularly evident in the Siberian taiga where reindeer are deeply engrained in the mobile-hunter-fisher-reindeer lifeways and economies. The Selkup and Khanty inhabiting the northern taiga engage in numerous niche constructing activities involving husbanded reindeer that are mutually beneficial for both species. Here, uniquely close human-reindeer relationships center on a few individual animals in strong contrast to large-scale reindeer husbandry practiced in the North Eurasian tundra. Within this context, we explore the reindeer domestication conundrum: that reindeer are routinely managed but clear ‘markers’ for the domestication syndrome are not readily evident. We discuss particular ontologies centered on animal agency, mutualism and reciprocity in circumpolar cultures and how these modes of being shape human-animal relationships, modifying selection-pressures that would have observable morphological or biomolecular effects. Investigations of taiga reindeer within an integrated theoretical framework that brings together human behavioral ecology with the animal turn could provide important nuance in understanding reindeer management and distinctions between wild and domesticated reindeer populations. Applying these concepts to zooarchaeological and biomolecular approaches through proof of concept ethnoarchaeological investigations could better define human-reindeer systems used in the past. In this paper, hunter-fisher-herders of Siberia and their animals will be reviewed and this new framework for investigating reindeer herding systems will be presented.

6 **SÁMI ANIMAL OFFERINGS AND REINDEER DOMESTICATION IN THE LIGHT OF ANCIENT DNA STUDIES**

**Abstract author(s):** Salmi, Anna-Kaisa - Heino, Matti - Äikäs, Tiina (University of Oulu) - Mannermaa, Kristiina - Kirkinen, Tuija (University of Helsinki) - Sablin, Mikhail (Russian Academy of Sciences) - Núñez, Milton - Okkonen, Jari (University of Oulu) - Dalén, Love (Swedish Museum of Natural History) - Aspi, Jouni (University of Oulu)

**Abstract format:** Oral

Reindeer herding emerged among the indigenous Sámi of Northern Fennoscandia in the period between ca. 800 and 1500 AD. While the details of the reindeer domestication process are still actively debated, it seems evident that the adoption of reindeer herding occurred at different times across northern Fennoscandia and that wild reindeer hunt continued to be economically important especially in the eastern part of the area. It has been hypothesized that the transition to reindeer herding affected Sámi ritual practice, especially animal offerings given at various sacred sites. In this paper, we investigate the relationship between reindeer offerings at Sámi offering sites and the emergence and spread of reindeer herding especially in Finland, where reindeer herding was historically in smaller role than in the mountain area and wild reindeer hunting continued. We analyze reindeer ancient DNA from three Sámi offering sites in Finland dating to ca. 1200–1650 AD. The results show that haplotypes common in modern domesticated reindeer replaced wild forest reindeer haplotypes in the faunal assemblages from offering sites ca. 1400–1600 AD. The results show that although the role of reindeer herding in the economy of the Sámi communities varied greatly, the transition to reindeer herding affected ritual practices across northern Fennoscandia, testifying of a shared way of reciprocating with the land and animals.

7 **FROM WILD REINDEER HUNTING TO REINDEER HERDING - NEW PRACTICE AND IDEOLOGICAL CHANGES.**

**Abstract author(s):** Andersen, Oddmund (Árran lulesamisk senter)

**Abstract format:** Oral

From wild reindeer hunting to reindeer herding - new practice and ideological changes.

The researchers in the different disciplines has for a long time discussed the rise of reindeer herding. This lecture asks the question of what kind of changes one can document as a hunter gather society change to reindeer husbandry. Firstly, emphasis is placed on the ideological changes in society. When reindeer herding arises, the domestic reindeer are given a changed status in the society. Reindeer luck become important, where it is stressed that the reindeer must survive in the landscape. The claim is that these changes can also be linked to a new practice, which means that the landscape are used in a new way, which creates new traces in the landscape. Through a presentation of archaeological material, the goal is to discuss whether such ideological changes can be read in the reindeer herding landscape in the Lule Sami area.

8 **FENNOSCANDIAN REINDEER ECONOMIES IN TRANSITION UNDER CLIMATIC CHANGE**

**Abstract author(s):** Aronsson, Kjell-Ake (Åjtte, Swedish Mountain and Sami Museum)

**Abstract format:** Oral

Reindeer herding has been practised for a long time in Fennoscandia. In the written sources tame reindeer are first mentioned in the Narration of Ottar from about AD 892. A more detailed description of Sami reindeer herding is given by Olaus Magnus in his History of the Nordic People published AD 1555 in Rome. This description is based on observations during a journey to northern Sweden AD 1518-19. Hunting of wild reindeer, reindeer herding and the use of reindeer for transports, milking and meat production are described with many details. The conclusion must be that Sami reindeer herding was established at that time. The economy was however a combination of reindeer herding with hunting and fishing. Genetic studies have demonstrated that domesticated reindeer were introduced from abroad. The first genetic signs of the new domesticated reindeer are from the 15th century. Was this the starting point for herding of the new genetic type of reindeer or can it be interpreted as the beginning of an expansion of herding? Can a climatic factor like the Little Ice Age have been of importance for this expansion? Archaeological and zoo archaeological data will be discussed in relation to climatic data.

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128 **TOWARDS AN ARCHAEOLOGY OF FERMENTED PRODUCTS: BUILDING A MULTIDISCIPLINARY APPROACH**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Drieu, Léa (University of York, Department of Archaeology, BioArCh) - Debels, Pauline (Université Paul-Valéry Montpellier III, UMR 5140 Archéologie des Sociétés Méditerranéennes; Université Paris 1 Panthéon-Sorbonne, UMR 8215 Trajectoires. De la sédentarisation à l'Etat)

**Format:** Discussion session (with formal abstracts)

Fermentation is a well-established practice in many human societies, suggesting that such food processing may have been widely exploited by ancient societies. It has certainly been a key parameter in the preservation and storage of food, but it may also have been sought as an alternative to cooking to modify food, create new flavours and textures. Written sources attest to the taste of historical societies for this type of product (e.g. wine and vinegar, beer, fish sauce and garum, etc.).

As fermentation causes changes in food products similar to those of natural degradation, it is often difficult to detect this type of



process in archaeological remains. In addition, fermented products can be made from a wide variety of foods (vegetables, fruits, cereals, milk, meat, fish, etc.), which can result in different archaeological remains (specific forms of pottery, storage structures, alterations in ceramic surfaces, botanical and faunal remains, molecular residues in the pottery sherds, etc.). There is therefore currently no archaeology of fermented products, but a multitude of approaches, often independent and rarely integrated.

This session is intended to present different methods of study of fermented products currently employed in archaeology (ceramology, archaeobotany, use-wear analysis, organic residue analysis, ethnoarchaeology, etc.), with the aim of developing an interdisciplinary approach, so as to explore as precisely as possible the fermentation processes used by ancient societies.

## ABSTRACTS

### 1 IN SEARCH OF LOST TASTES - TYPES OF WINES IN CLASSICAL ANTIQUITY AND METHODS OF THEIR PRODUCTION

**Abstract author(s):** Komar, Paulina (Cardinal Stefan Wyszynski University in Warsaw)

**Abstract format:** Oral

“Although generally it is said that ‘de gustibus non est disputandum’, the main purpose of this presentation is to discuss the tastes of ancient wines and their possible production processes. Ancient texts, both Greek and Latin, will be analysed here using oenological perspective in order to show what qualities of wines are hidden under certain epithets that were used by ancient authors to describe them. For example, certain ancient writers mentioned beverages, which were κίρρόι, that is yellow. However, what does it really mean in terms of the production of such wines? At the same time, τεθλασσωμένοι were the wines made with the admixture of seawater; but what was the reason of adding this substance during the process of wine fermentation?

Experimental archaeology is also helpful in understanding the processes of production and recreating the taste of ancient wines. For example, an experiment conducted by A. Tchernia and H. Durand, which aimed in producing a beverage according to a recipe by Columella, allowed to work out one of the methods of Roman wine making as well as reviving the taste of wine that the Romans enjoyed. Therefore, this presentation will use both modern, oenological approach to ancient texts and the results of experimental archaeology to shed light upon the state of advancement of the ancient wine production.

### 2 IDENTIFYING WINE IN ARCHAEOLOGICAL POTTERY? A CASE STUDY FROM THE LATE ANTIQUE AND EARLY MEDIEVAL SICILY

**Abstract author(s):** Drieu, Léa (Department of Archaeology, BioArCh, University of York) - Orecchioni, Paola (Dipartimento di storia, patrimonio culturale, formazione e società, Università degli Studi di Roma Tor Vergata) - Capelli, Claudio (Dipartimento di Scienze della Terra, dell’Ambiente e della Vita, Università degli Studi di Genova) - Meo, Antonino (Dipartimento di storia, patrimonio culturale, formazione e società, Università degli Studi di Roma Tor Vergata) - Lundy, Jasmine - Bondetti, Manon (Department of Archaeology, BioArCh, University of York) - Molinari, Alessandra (Dipartimento di storia, patrimonio culturale, formazione e società, Università degli Studi di Roma Tor Vergata) - Carver, Martin (Department of Archaeology, University of York) - Craig, Oliver E. (Department of Archaeology, BioArCh, University of York)

**Abstract format:** Oral

Wine, an emblematic fermented commodity of the Mediterranean, remains difficult to identify in archaeology, despite being the focus of many investigations (amphora morphology and provenance, aDNA, carpological studies, etc.). While the search for wine biomarkers (particularly tartaric acid) began with the very first attempts of organic residue analysis of archaeological pottery, a wide range of methods have been used with little consensus.

In order to study the wine trade in Sicily between Late Antiquity and the Early Middle Ages, and the possible impact of the successive Byzantine and Arab conquests, it was necessary to set up a rigorous methodology, which optimises extraction yields and avoids false positives. The comparative analysis of authentic references and archaeological samples through different approaches revealed the high efficiency of butylation under acidic conditions to extract tartaric acid. The difficulty in understanding the natural origin of other small acids makes their presence in archaeological ceramics misleading. The specificity of tartaric acid in terms of its natural origin was investigated using a context where the grape is not attested (Russian prehistoric potsherds). Analyses showed that in the absence of other archaeological or historical evidence, tartaric acid could only be interpreted as a fruit biomarker. Finally, the analysis of control samples (cooking pots, handles, tiles, sediments) and a large corpus of amphorae produced and imported in Sicily from the 5th to 11th century AD demonstrated the need for tartaric acid quantification and the use of a limit of interpretation to avoid false positives. Based on these methodological developments and the selection of morphologically and petrographically well-characterised vessels, it has been possible to demonstrate an unexpected continuity of the exploitation and trade of grapevine products from the Late Roman period to the Early Middle Ages in Sicily, in spite of the succession of regimes that have dominated the island.

### 3

### DRINKING IN THE DARK – USE-WEAR EVIDENCE OF FERMENTATION INSIDE POTTERIES FROM LATE NEOLITHIC CAVE CONTEXTS (SOUTHERN FRANCE, 2900-2300 BCE)

**Abstract author(s):** Debels, Pauline (University Paul-Valéry Montpellier 3, UMR 5140 ASM; University Paris 1 Panthéon-Sorbonne, UMR 8515 Trajectoires)

**Abstract format:** Oral

Karstic contexts of the south of France have led to a unique way of collecting water during the late Neolithic. Rain water infiltrates the pores and seepages of the limestone and drips into caves. The Neolithic exploited this feature by installing large ceramic vessels under the main water flows and hence, compensated for its absence at the surface. This process is now well documented (Galant 2009, 2012).

A functional approach of the potteries, combining use-wear analysis and morphofunctional studies were carried in five “cistern-caves” (Le Claux, Hérault; Les Pins, Gard; Gaude; Ardèche; La Rouvière; Gard and L’Avenas, Hérault). (MNI 421). The goal was to verify if additional activities could be identified inside the caves.

To help build the methodology of identification an experimental reference collection was carried. 48 different experiments were tested in 44 different pots. 12 foodstuffs were selected according to archaeological data from contemporary sites and each use was repeated in pots with varying technical features. By doing so, a signature trace of the production of fermented liquids (barley beer and mead), was evidenced.

The result of this interdisciplinary study highlighted the use of some of the caves to store acid and fermented liquids in addition to their function of cistern caves. In the cave of Le Claux, this production was specifically localised in the deepest part of the cave and affected almost half of the ceramic assemblage.

This methodology using macroscopical observations could allow fast and inexpensive identification of fermented beverage production and consumption in archaeological data.

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### ARCHAEOGENETICS, THE REAL MEANING: TOWARDS SYNERGIES BETWEEN GENETICS AND ARCHAEOLOGY

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Szecsenyi-Nagy, Anna (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Mitnik, Alissa (Department of Genetics, Harvard Medical School, Boston; Department of Archaeogenetics, Max-Planck Institute for Science of Human History, Jena) - Rivollat, Maite (Department of Archaeogenetics, Max-Planck Institute for Science of Human History, Jena; PACEA – UMR 5199, University of Bordeaux) - Eisenmann, Stefanie (Department of Archaeogenetics, Max-Planck Institute for Science of Human History, Jena) - Gerdau, Karina (University of Strasbourg)

**Format:** Regular session

With the methodological advancements in ancient DNA research during the past decade, archaeologists and geneticists were equally confronted with overwhelming expectations from the respective other field. Both realized quickly that these expectations were not always met, mainly because of a discrepancy in the resolution of the data under study. In the last few decades, archaeology has turned to work mostly from a bottom-up perspective, while the majority of genetic studies have been working from the top down. As a consequence, the conclusions and models presented in genetic studies are often oversimplified and based on grouping together ancient people who may have never thought of themselves as a coherent entity. These different angles from which researchers are looking at human history resulted in major misunderstandings.

How can we reconcile those different scales? Where do these different levels of human history overlap, where do they not? How can genomic histories be correlated with the archaeological record? What issues do archaeologists face when they try to incorporate the ancient DNA results in their research? What respective expectations can really be met in the end?

We invite all researchers involved in genetics and archaeology who have a critical sense for interdisciplinary discussion of their results to present their research. Contributions can address, but are not limited to, the following questions and research topics:

- Large- and small-scale case studies combining both fields, genetics and archaeology (i. e. population genetics, analyses of social structure, kinship, site studies, human diseases, domestication),
- Methodologies to integrate the different kinds of data that geneticists and archaeologists are dealing with,
- Theoretical discussions about confrontation and integration of both fields,

The session’s objective is to find common ground on which both fields, archaeology and genetics, can really come together and do integrative research.

1 INSIDE THE BLACKBOX OF ARCHAEOGENETICS – A DIALOGUE BETWEEN DISCIPLINES

**Abstract author(s):** Frieman, Catherine (School of Archaeology and Anthropology, Australian National University) - Mikheyev, Alexander (Research School of Biology, Australian National University)

**Abstract format:** Oral

Human archaeogenetics offers a powerful scientific toolkit for exploring ancient mobility, connectedness and inheritance; but it is neither as all-powerful as its most strident supporters argue nor as innately damaging as its most sceptical detractors worry. In this paper, we present the results of an ongoing dialogue between an evolutionary biologist who has somewhat accidentally ended up working on ancient human DNA and a social archaeologist who worries considerably about the same. We focus on areas of friction between the disciplines: the temporality of genetic versus archaeological material, the types and intent of the research questions we ask, the language we use to explicate our results. We believe that this sort of intellectual cross-pollination enriches both disciplines and is essential when tackling the multidisciplinary questions surrounding human history. Our aim is not to solve the divide between the disciplines, but to develop a discourse about the study of ancient human DNA which encompasses both good science and humanity.

2 THE ANCIENT GENOME ATLAS - A NEW OPEN-ACCESS INTERACTIVE ONLINE TOOL

**Abstract author(s):** Nørtoft, Mikkel - Schroeder, Hannes (The Globe Institute, Faculty of Health and Medical Sciences, University of Copenhagen)

**Abstract format:** Oral

Since the first ancient genome was published in 2010, the field of ancient genomics has witnessed an explosion of new genome data. With more than a thousand ancient genomes now being sequenced every year, it is becoming increasingly difficult for experts and non-experts alike to keep track of the latest developments. Arguably, the rapid rise in ancient genomics has also contributed to deepening the “DNA divide” between geneticists and archaeologists. We developed a new open-access online tool to provide a much-needed overview of the field of ancient human genomics and to help bridge the “DNA divide”. The Ancient Genome Atlas (www.ancientgenomes.com) is an interactive web-resource that maps every single ancient human genome ever published in time and space. At the point of writing, we have mapped over 3,400 ancient human genomes and each genome is colored by its main ancestry component. Using simple intuitive controls, users can explore how migrations and gene flow have changed the genetics of human populations over the last ~50,000 years. We have included metadata for every single genome and we are currently working on including information on language distributions and archaeological cultures as well. Still a work in progress we plan to develop the Atlas in the coming years and hope that in time it will become a useful tool for the community. In this session, we will present the Atlas and discuss the choices that have gone into making it and hope to stimulate discussion. The development of the Ancient Genome Atlas was funded by the Carlsberg Foundation and HERA (Humanities in the European Research Area).

3 CULTURAL AND GENETIC DIVERSITY SHAPED BY THE NEOLITHIC TRANSITION

**Abstract author(s):** Santos, Patricia (Centre National de la Recherche Scientifique - CNRS, UMR5199 PACEA) - Ghirotto, Silvia (Department of Mathematics and Computer Science, University of Ferrara) - Barbujani, Guido (Department of Life Sciences and Biotechnology, University of Ferrara) - Rigaud, Solange (Centre National de la Recherche Scientifique - CNRS, UMR5199 PACEA)

**Abstract format:** Oral

The Neolithic transition is characterised by the shift from foraging to farming and started in Europe some 8000 years ago. After a long-standing debate concerning whether this transition was mostly due to the intense dispersal of Near-eastern farmers into Europe, or due to cultural transmissions with indigenous foragers, it is now commonly accepted that the two mechanisms conjointly acted, but were regionally patchy with various intensity. The transition was not a linear process and it was slowed down, stopped or abandoned several times in specific regions before being definitely adopted in many regions.

In the present study, we focus on the way the transition to farming affected the shaping of the past European cultural and population diversity, by contrasting a personal ornament dataset with ancient genetic data for human populations living in Europe during the Mesolithic/Neolithic period. Identifying how people, but also ideas and symbols transmitted by personal ornaments, moved from one society to another will contribute to a more comprehensive view of the variety of interactions that occurred between the last foragers and the first farmers in Europe 8000 years ago. The analysis will also allow to discuss whether or not the various demographic and cultural events were synchronic, and to try to infer the degree of cultural and social permeability between biologically distinct populations.

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AN INTERDISCIPLINARY STUDY OF THE SOCIAL STRUCTURE FROM THE EARLY NEOLITHIC TO THE EARLY BRONZE AGE IN CENTRAL GERMANY

**Abstract author(s):** Penske, Sandra (Max Planck Institute for the Science of Human History) - Küßner, Mario - Nováček, Jan (Thüringisches Landesamt für Denkmalpflege und Archäologie) - Friederich, Susanne - Meller, Harald (Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt) - Krause, Johannes - Haak, Wolfgang (Max Planck Institute for the Science of Human History)

**Abstract format:** Oral

Past archaeogenetic studies have revealed two major genetic turnover events during Europe’s prehistory. The first major event describes a change of the genetic makeup at the time of the transition from a hunter-gatherer to a farming subsistence. The second major event is linked to the arrival of ‘Steppe ancestry’ during the early Bronze Age. However, the fine-scale population processes, and the timing and speed of these major changes, are not well understood.

In a novel interdisciplinary approach, we integrate genetics, archaeological and anthropological information, isotope analysis and new modelling approaches to answer detailed questions about mobility and migration, social structure, kinship and pedigree of pre-historic societies in Central Germany. By analyzing new genome-wide data in this way for an additional 138 individuals from central Germany, ranging from the early Neolithic to the late Bronze Age (6290 to 2960 calBP), we aim to address these questions.

The genetic results are consistent with previous findings about German early and middle Neolithic individuals. During the Late Neolithic, Yamnaya-related steppe ancestry arrives in Central Europe and subsequently leads to the spread of the Corded Ware Cultural Complex. Here, we present the earliest dated Corded Ware-associated individuals known from Central Germany (~2700 calBP) and can confirm a rapid spread of this ancestry profile.

In addition, we also investigated a number of closed late Neolithic and early Bronze Age burial sites by integrating genetic, isotopic, archaeological and anthropological data. We observe an unexpectedly high amount of first-degree genetic relatives. The resulting demographic profile and kinship structure suggests a patrilocal society with a low variability in male Y-haplogroups in contrast with much more varied mt-haplogroups.

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ARCHAEOLOGY AND GENETICS ELUCIDATE SOCIAL STRATIFICATION, KINSHIP, AND DIVERSE DEMOGRAPHIC PROCESSES IN NEOLITHIC AND BRONZE AGE CROATIA

**Abstract author(s):** Freilich, Suzanne (University of Vienna)

**Abstract format:** Oral

The Balkan Peninsula was an important migration corridor across Europe, and is a key region for understanding the development of social organisation in early settlements and their genetic composition. Our understanding of how social status was acquired in prehistoric Europe, as well as mating and residency patterns is often restricted to funerary practices or stable isotope data. To investigate this further with genetic analyses, two sites in northeastern Croatia dating to the Middle Neolithic Sopot culture and the Middle Bronze Age Transdanubian Encrusted Pottery Culture were selected, which contain inhumations with diverse grave goods as well as atypical depositions.

Ancient DNA was extracted from 28 specimens and built into double-stranded libraries for shotgun sequencing to an average of 1X coverage. Following stringent quality control measures, genetic analyses were performed to identify biological kin, assign uniparental haplotypes, model individual ancestries, and estimate levels of inbreeding. This was integrated with archaeological evidence of burial arrangements and furnishings and the anthropological data, to help understand within-population heterogeneity, social status and organisation, as well as mating and residency patterns.

Results indicate a large, outbred community in the Middle Neolithic, with little recent admixture and no significant differences in ancestry between individuals with diverse burial rites. However, we do find a number of individuals who exhibit signs of recent endogenous practices. High diversity also characterises the Bronze Age, where we see a rise in social stratification among close male kin buried with divergent grave goods, and the presence of richly furnished subadult graves. These results suggest the development of an increasingly complex social landscape, where burial arrangements may be dependent on a variety of factors.

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INFERENCES ON ORIGIN AND SOCIAL ORGANISATION OF EARLY AND MIDDLE BRONZE AGE COMMUNITIES LIVED IN THE WESTERN CARPATHIAN BASIN

**Abstract author(s):** Gerber, Dániel - Székely, Orsolya (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Szeifert, Bea (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Egyed, Balázs - Ari, Eszter (Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Köhler, Kitty - Mende, Balázs (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Fábíán, Szilvia (Hungarian National Museum, Budapest) - Kiss, Viktória - Szécsényi-Nagy, Anna (Institute of Archaeology, Research Centre for the Humanities, Budapest)

**Abstract format:** Oral

The Early and Middle Bronze Ages (2500 – 1500 BCE) were characterized by various pottery styles in the Carpathian Basin. According to previous studies, this period was considered as a critical turn-point for population shifts in the region with the genetic influx of groups connected to Beaker Complex and steppe-related cultures. Two of the subsequently prevailing cultures’ populations, whose



of the Kisapostag/Early Encrusted Pottery (KEP) and Transdanubian Encrusted Pottery (TEP) cultures, settled on the majority of to-day’s Western Hungary for more than 600 years between 2100 – 1500 BCE. Their genetic makeup, however, is yet to be described, which faces challenges due to the dominant cremation practices from 1800 BCE onward. By analysing whole genome target capture and shotgun data of 19 newly sequenced individuals from Balatonkeresztúr-Réti-dűlő site, we were able to recover their social organisation, origin and relationship with each other. Our results indicate complex population movements in the area attributed to various sources, but we intend to extend our dataset for more detailed analyses of the region and period. This project was funded by the Momentum Mobility Research Group (LP2015/3) of the Hungarian Academy of Sciences.

LATE BRONZE AGE KUCKENBURG: A UNIQUE WINDOW INTO THE URNFIELD CULTURE IN CENTRAL EUROPE

**Abstract author(s):** Orfanou, Eleftheria - Himmel, Marie (Max Planck Institute for the Science of Human History, Department of Archaeogenetics) - Paust, Enrico (Institut für Ur- und Frühgeschichte, Friedrich-Schiller-Universität Jena) - Roberts, Patrick - Zach, Barbara - Spengler, Robert (Max Planck Institute for the Science of Human History, Department of Archaeology) - Ettel, Peter (Institut für Ur- und Frühgeschichte, Friedrich-Schiller-Universität Jena) - Haak, Wolfgang (Max Planck Institute for the Science of Human History, Department of Archaeogenetics)

**Abstract format:** Oral

The coexistence of different mortuary practices within a given site offers the possibility of studying the intersection of demographic, social, and cultural variability. This study focuses on the Late Bronze Age (LBA) site of Kuckenburg located in Central Germany. The site is unique because it has both inhumations and cremations ascribed to the Urnfield period, a time period when cremations were, elsewhere, usually the main form of mortuary practice. It has also been continuously occupied from the Late Paleolithic until the Early Middle Ages, enabling comparison of inhumations from different time periods.

We apply a multidisciplinary approach, including ancient DNA, stable isotope analysis, osteoarchaeology, and material culture analysis to get a better understanding of the Urnfield related groups in the LBA of Central Europe. Ancient DNA analyses shed new light on the different mortuary practices, including the relationship of kinship and population affinity to burial location.

Analysis of genome-wide data from 18 inhumated individuals show that these individuals share the same genetic profile with individuals of the preceding periods of Early Bronze Age (EBA), indicating genetic continuity over time. Meanwhile, stable carbon and nitrogen isotope analysis suggest a similarity of diet to this earlier period, with some subtle variation.

We are also able to determine that three out of 18 individuals are first-degree relations: a mother with two daughters. This triple burial, like most burials at Kuckenburg, points to a multi-phase burial rite.

Overall, our findings indicate that different mortuary practices at Kuckenburg were not the result of a new genetic group coming in but rather increasing cultural variation within a local population. Our study shows that combination of multiple lines of evidence, such as ancient DNA, archaeology, and isotope studies, is necessary if our aim is to reconstruct a more complete picture of the past.

LA ALMOLOYA AND THE SOCIAL STRUCTURE OF ARGARIC SOCIETIES IN THE EARLY BRONZE AGE OF SOUTHERN IBERIA

**Abstract author(s):** Villalba-Mouco, Vanessa (Department of Archaeogenetics, Max Planck Institute for the Science of Human History) - Rihuete-Herrada, Cristina - Micó, Rafael - Oliart, Camila - Fregeiro, María (Department of Prehistory, Universitat Autònoma de Barcelona) - Rohrlach, A - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History) - Lull, Vicente (Department of Prehistory, Universitat Autònoma de Barcelona) - Risch, Roberto (Department of Prehistory, Universitat Autònoma de Barcelona; Department of Archaeogenetics, Max Planck Institute for the Science of Human History) - Haak, Wolfgang (Department of Archaeogenetics, Max Planck Institute for the Science of Human History)

**Abstract format:** Oral

The emerging Bronze Age in Southern Iberia involved important changes from an archaeological perspective: Late Chalcolithic settlements were abandoned in favour of – occasionally fortified – hilltop sites. At the same time, funerary rites changed with collective graves disappearing and individual and double burials emerging. Some of the later exhibit very distinctive grave goods which indirectly reflect an increasingly hierarchical social organisation. These changes are particularly marked in the Early Bronze Age group of El Argar, which embodies all these changes well. In order to understand whether these social changes involved people coming from other territories, as well as to disentangle the role of descent in socio-political asymmetries already defined by archaeological indicators alone, we performed population genetic and kinship analyses at La Almoloya, one of the key sites of the El Argar group that is nearly fully excavated. We integrated the genetic results with chrono-stratigraphy, information about burial rites and the anthropological record.

Our results revealed the persistence of male lineages over at least three generations. In contrast, adult females buried at the site were found to be genetically unrelated at either first or second degree, suggesting a strong patrilocal system and female exogamy as dominant practices. We also found that adult individuals from double burials were unrelated, and in some cases had offspring together. Moreover, some males also had children with different females, resulting in detectable half-sibling relationships. Despite the observation that adult women do not have close relatives among themselves at the site, they are still buried with high status grave goods. Our results show how the integration of genetics with archaeological and anthropological results provide powerful, unprecedented insights into the social organisation of past societies.

GENOMIC ANALYSIS OF HUMAN REMAINS RECOVERED AT THE PHOENICIAN-PUNIC HYPOGEA FROM VILLARICOS (ALMERÍA, SPAIN)

**Abstract author(s):** Olalde, Iñigo (Institute of Evolutionary Biology, CSIC-Universitat Pompeu Fabra, Barcelona) - Ringbauer, Harald (Department of Genetics, Harvard Medical School, Boston) - Mittnik, Alissa (Department of Genetics, Harvard Medical School, Boston) - Rodero, Alicia (Museo Arqueológico Nacional, Madrid) - Rohland, Nadin (Department of Genetics, Harvard Medical School, Boston) - Lalueza-Fox, Carles (Institute of Evolutionary Biology, CSIC-Universitat Pompeu Fabra, Barcelona) - Reich, David (Department of Genetics, Harvard Medical School, Boston; Broad Institute of MIT and Harvard, Cambridge; Howard Hughes Medical Institute, Harvard Medical School, Boston)

**Abstract format:** Oral

The maritime expansion of the Phoenicians during the 1st millennium BC and their founding of trading colonies created a network that connected human societies across the entire Mediterranean sea. One of these colonies is the city of Baria (southeast Iberia), founded circa VII century BC and remaining under Phoenician/Punic control until the Roman Conquest during the Second Punic war. Excavation of its associated funerary area, the Villaricos cemetery, started in 1890 by Luis Siret, uncovering 1,842 graves whose associated materials were deposited at the Museo Arqueológico Nacional (Madrid, Spain) in 1935. The most prominent set of graves is a group of hypogea excavated directly on the rock that were likely associated to the ruling elites of Baria. To understand the ancestral origins, degree of integration with the locals, and social structure of the people buried in the hypogea, we obtained permission to apply archaeogenetics techniques to the human remains from Siret’s excavation and generated genomic data from 17 individuals. We found high genetic heterogeneity among the studied individuals, who could be classified into at least three groups according to their ancestry: one with an entirely local Iberian ancestry represented by one female, another with a Central/eastern Mediterranean origin and another with varying degrees of North African ancestry. We highlight the results from hypogeum 774 where the five analyzed individuals had a Central/eastern Mediterranean origin, were close relatives and showed clear genetic evidence of being offspring of related parents. These results provide an unprecedented view into the social organization of the elites of a Phoenician-Punic colony and should be interpreted together with the abundant archaeological information available for the Villaricos cemetery.

UNDERSTANDING AND (RE-)INTERPRETING THE URVILLE-NACQUEVILLE BURIED COMMUNITY: A DIALOGUE BETWEEN ARCHAEOLOGY AND GENETICS

**Abstract author(s):** Fischer, Claire-Elise - Pemonge, Marie-Hélène (UMR 5199 PACEA) - Lefort, Anthony (INRAP) - Rottier, Stéphane - Deguilloux, Marie-France (UMR 5199 PACEA)

**Abstract format:** Oral

Over the past decades, ancient DNA (aDNA) studies have mainly addressed broad continental scale issues to provide new lines of evidence concerning ancient human population’s dynamics. Only very recently, archaeogenetic studies targeting whole communities have permitted to move beyond the continental scale and to shed light on specific populations’ social functioning. However, for both broad and local scale populations’ dynamics questions, a real dialogue between geneticists and archaeologists is necessary to provide the most cautious scenarios.

We propose to illustrate the need of multidisciplinary dialogue through the special case of Urville-Nacquerville (Late Iron Age, Normandy, France), a necropolis that welcomed a cosmopolitan group associated to a port facing the Channel. Through several examples, we will show how genetic data have permitted to reinterpret several funerary gestures, notably the recovery of skulls or the presence of plural tombs. On the other hand, we will show how the precise understanding of both the funerary site functioning and the constitution of the “dead community”, addressed through archaeological, anthropological and small-scale aDNA studies, constitute a preliminary process necessary to the appropriate use of the group gene pools for the reconstruction of broad-scale population dynamics.

UNIPARENTAL GENETIC DATA EXPAND THE ARCHAEOLOGICAL AND HISTORICAL KNOWLEDGE OF THE AVAR ELITE POPULATION

**Abstract author(s):** Csáky, Veronika (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences Centre of Excellence) - Gerber, Dániel - Szeifert, Bea (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences Centre of Excellence; Department of Genetics, ELTE Eötvös Loránd University) - Koncz, István (Institute of Archaeological Sciences, ELTE Eötvös Loránd University) - Mende, Balázs - Csiky, Gergely (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences Centre of Excellence) - Jeong, Choongwon (Department of Archaeogenetics, Max Planck Institute for the Science of Human History; School of Biological Sciences, Seoul National University) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History) - Vida, Tivadar (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences Centre of Excellence; Institute of Archaeological Sciences, ELTE Eötvös Loránd University) - Szécsényi-Nagy, Anna (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences Centre of Excellence)

**Abstract format:** Oral

The Avars arrived in the Carpathian Basin in 568 AD and founded their empire (Avar Qaganate) which played an important geopolitical role in Central European history. The Asian origin of Avars is supported by written sources as well as archaeological findings, however, localisation of their homeland is still questionable and controversial. With our study, we try to answer the research questions of



archaeologists and historians regarding to the social organization and origin of Avar elite stratum.

We investigated genetic variability of twenty-six individuals belonging to the high-ranking Avar elite group excavated from ten different cemeteries at the centre of the Carpathian Basin more than a century after the Avar conquest. Seven out of ten are located in the Danube-Tisza Interfluve, probably in the primarily power centre, where also the eight members of the highest elite Avar group were found.

The maternal genetic data of the studied Avar group is heterogenous compared to the paternal gene pool, which is mostly composed of N1a1. M46 haplotypes detected uniquely in the Danube-Tisza Interfluve. The mitochondrial lineages belong to a wide range of Eurasian haplogroups with dominance of Asian haplotypes.

We determined paternal kinship of four and nine individuals buried inside and between cemeteries belonged mostly to the “Kunbábony group”. Furthermore, we found some maternal kinship based on identical mitochondrial haplotypes between six individuals.

Based on population genetic and phylogenetic analyses the results suggest East-Central Asian origin of Avar period elite society (i.e. Southern Siberia and Mongolia), which is supported also by nuclear genomic data and some of archaeological findings. Moreover, we assume, that the Avars migrated rather as closed society with endogamous group of families than military corps, because the Asian maternal and paternal genetic composition of the Avar elite was preserved through several generations after the Avar conquest in the Carpathian Basin.

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### A NEW STUDY ON A WEAPON GRAVE AT SUONTAKA, FINLAND

**Abstract author(s):** Moilanen, Ulla (University of Turku, Department of Archaeology; University of Turku, Department of Biology) - Salmela, Elina (University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme; Max Planck Institute for the Science of Human History, Department of Archaeogenetics; University of Turku, Department of Biology) - Kirkinen, Tuija (University of Helsinki, Department of Philosophy, History, Culture and Art Studies) - Saari, Nelli-Johanna (University of Helsinki, Department of Philosophy, History, Culture and Art Studies; Max Planck Institute for the Science of Human History, Department of Archaeogenetics; University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme) - Rohrlach, A (Max Planck Institute for the Science of Human History, Department of Archaeogenetics; Australian Research Council Centre of Excellence for Mathematical and Statistical Frontiers, University of Adelaide ) - Krause, Johannes (Max Planck Institute for the Science of Human History, Department of Archaeogenetics) - Onkamo, Päivi (University of Turku, Department of Biology; University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme)

**Abstract format:** Oral

An exceptional inhumation grave was found from (Hattula) Tyrväntö Suontaka Vesitorninmäki, Finland, in 1968. The grave seemed to contain at least two Early Medieval swords, and as a big surprise to the excavation leader, two brooches typically associated with a feminine dress of the era. Since then, the Suontaka grave has been interpreted as evidence for powerful women, even female warriors and leaders, existing in Viking Age Finland. At the same time, others have vehemently denied the possibility of a female sword grave and tried to explain it as a double burial of a male and a female. For the first time in history, the grave has been analysed with modern methods. The analysis includes a thorough examination of the find context, an analysis of a soil sample for microremains, and an ancient-DNA analysis. The new multidisciplinary investigation combining traditional archaeological analysis and scientific methods seeks to clarify the context on the grave, possibly debunk some myths surrounding it, and also yield brand-new details on the burial and the buried individual.

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### A HAPPY MARRIAGE: THREE EXAMPLES OF INTERDISCIPLINARY RESEARCH IN THE CANARY ISLANDS

**Abstract author(s):** Ordóñez, Alejandra (Department of Geography and History, Humanities Faculty, Section of Prehistory, Archaeology, and Antique History. University of La Laguna; Department of Biochemistry, Microbiology, Cell Biology and Genetics. Universidad de La Laguna) - González-Serrano, Javier (Department of Biochemistry, Microbiology, Cell Biology and Genetics. Universidad de La Laguna) - Arnay, Matilde (Department of Geography and History, Humanities Faculty, Section of Prehistory, Archaeology, and Antique History. University of La Laguna) - Fregel, Rosa (Department of Biochemistry, Microbiology, Cell Biology and Genetics. Universidad de La Laguna)

**Abstract format:** Oral

When scientists discovered DNA molecules could survive for hundreds of thousands of years, paleogenetics appeared to be a promising tool for solving all the questions archaeologists have long been trying to resolve. However, the collaboration between geneticists and archaeologists has proven not to be as straightforward as expected and there has been some friction between both disciplines. With the arrival of the paleogenomics revolution, nobody denies the importance of ancient DNA studies in archaeology and the necessity for both disciplines to work together. The real problem is how to achieve real interdisciplinary work that goes beyond just having people from both disciplines on the same research team. In this presentation, we show three examples of how our multidisciplinary group has joined forces to find a common language. The input of both archaeology and genetics has been fundamental to delve deeper into the demographic history of the Canary Islands. In the first example, we present the study of the aboriginal population of the island of El Hierro, where archaeology has allowed us to go beyond genetic phenomena to explain the fixation of a maternal lineage in the Punta Azul site. The second and third examples show how archaeology, written sources, and genetics can complement each other when studying subjects as complex as the slave trade in the Modern Age and the admixture

process in colonial societies. With these three cases, we highlight that finding ways of real communication and a common language between disciplines is possible and necessary in paleogenomics studies.

a.

### A GENOME-WIDE STUDY OF THE 12TH CENTURY COMMUNITIES ILLUMINATES GENETIC MAKEUP IN THE LATE IRON AGE SOUTHWEST FINLAND

**Abstract author(s):** Saari, Nelli-Johanna (University of Helsinki, Department of Philosophy, History, Culture and Art Studies; Max Planck Institute for the Science of Human History, Department of Archaeogenetics; University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme) - Majander, Kerttu (Institute of Evolutionary Medicine, University of Zurich; Max Planck Institute for the Science of Human History, Department of Archaeogenetics) - Salmela, Elina (University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme; Max Planck Institute for the Science of Human History, Department of Archaeogenetics; University of Turku, Department of Biology) - Krause, Johannes (Max Planck Institute for the Science of Human History, Department of Archaeogenetics) - Onkamo, Päivi (University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme; University of Turku, Department of Biology)

**Abstract format:** Poster

Southwest Finland has rich Late Iron Age archaeological records that show diverse cultural and trade networks. Ancient DNA analyses from human remains, however, have remained scarce due to the acidic Finnish soil that leads to a rapid decay of bone material. Two large inhumation burial grounds from the Crusade Period (1050–1150 CE) in Southwest Finland, Raisio Kansakoulunmäki and Masku Humikkala, represent the transition period towards Christianity. The favourable skeletal preservation on these sites offers a possibility to analyse the genetic structure of the Iron Age communities behind the burial context. Combining this genetic data to other periodically and regionally close individuals enables an in-depth examination of the population history of Late Iron Age Southwest Finland.

In this archaeogenetic study we investigate the genetic composition of altogether 29 individuals, 14 from Kansakoulunmäki and 15 from Humikkala. A closer analysis of kinship patterns and genetic ancestry provides comprehensive information of the Late Iron Age communities, such as family relations and patrilocality. All samples in this study have been processed in dedicated clean-room facilities. Ancient DNA libraries have been enriched for ancestry-informative markers in human DNA, and the data retrieved with high-throughput next-generation sequencing. The preliminary results for seven Raisio Kansakoulunmäki individuals indicate a genetic continuity with contemporary Finnish populations. Our current analyses intend to provide a detailed view of the ancestry components, kinship and genetic affinities for all successful samples.

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### MATERIALIZING SOUND IN ANTIQUITY: MATERIALS AS A BODILY AND SYMBOLIC COMPONENT OF SOUND OBJECTS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Saura-Ziegelmeyer, Arnaud (Université Toulouse II Jean Jaurès; Institut Catholique de Toulouse) - Sánchez Muñoz, Daniel (Universidad de Granada)

**Format:** Regular session

Materials used to make musical instruments or sound objects are essential in archaeomusicological studies. They allow us to assess the acoustic capacities of artefacts and to reconstruct the soundscapes of Antiquity. Bronze (and more generally metals), but also wood or terracotta have their own logic, and they raise a set of questions (conservation, restoration, lifespan, sound range).

Beyond their inherent acoustic properties, materials can also be addressed as components and indicators of practical and symbolic functions. Different issues can be tackled in this perspective: does a change in material induce a change in function? Can the use of a sound object be reduced to the material that composes it? Do materials have an influence on the place and the perception of the sound objects into the ancient Soundscape? Is the classification of archaeological finds through materials relevant and accurate?

This last question is especially relevant. Indeed, various classifications of instruments in Antiquity coexist. Presently, the classifications according to the materials are particularly challenging. This is the case, among others, of the Mesopotamian and Chinese classification of instruments.

From our knowledge, there is no dedicated contribution in archaeomusicology about materials as a bodily and symbolic component of sound objects. This workshop will provide an innovative contribution for future archaeomusicological research. Scholars from various fields (archaeology, ancient history, philology, etc.) are welcome to apply to this session. Submitted papers may focus on materials or sonorous objects, as well as on methodological (approaches, typology, organology, etc.) or historiographical questions raised by the theme. We accept papers from any field and culture included in the Antiquity (3rd millennium BCE - 6th century CE, Africa, Asia and Europe). The outcomes and discussions of this session will be published.

We also want to organize a brief concert in order to explore in a practical way the role of materials in the configuration of ancient instruments and sound objects. People presenting papers can join this event.

1 TERRACOTTA FIGURINES AS INSTRUMENTS IN HELLENISTIC BABYLONIA: THE MATERIAL INTERSECTION OF REAL (TERRACOTTA) RATTLE AND DEPICTED (METALLIC OR LEATHER) PERCUSSIVE

**Abstract author(s):** Langin-Hooper, Stephanie (Southern Methodist University)

**Abstract format:** Oral

What does it mean for an object to be a figurine and a musical instrument at the same time? This paper will explore the corpus of figurine rattles from Hellenistic Babylonia. In these small depictions of child busts, the figure is shown holding and/or playing a circular object - either a metallic idiophone or membranophone drum. All of these objects, real or depicted, rattle or drum, are percussion instruments - producing sounds in similar ways by shaking and striking. Indeed, this functional connection was undoubtedly integral to the rationale for creating these objects. The real-life user of the figurine rattle could participate in the "performance" - perhaps in a less skilled manner with an instrument with fewer tonal subtleties, but with similar quality of sound.

Or was it? This paper will explore the differences in both function and meaning between terracotta, animal skin, and metal as sound-producing surfaces. The material distinction between real-life and depicted instrument will also be explored as a deliberate parallel to contrast between the figurine child's terracotta skin and the real-life organic skin of the human user. Overall, this paper will argue that the material distinction was of crucial importance, placing the figurine in a fantasy realm separated from real life during a period of social instability and change.

2 CLAPPERS IN ANCIENT EGYPT - WOOD OR IVORY FOR THE SAME EVENT OR RITUAL?

**Abstract author(s):** Köpp-Junk, Heidi (University of Trier)

**Abstract format:** Oral

Music is attested in Egypt since the 5th millennium BC with the rattle being the oldest instrument. The earliest depictions of clappers are attested in the 4th millennium, while the earliest archaeological evidence dates to 3000 BC. Egyptian clappers are made of different materials like ivory and wood, and they are attested in various shapes: some are undecorated and bent, others are richly ornamented with the face of the goddess Hathor. Furthermore there are beside hand-shaped ones those in animal form. From time to time they are hollowed in order to increase the volume. The lecture addresses the following questions: When do the different materials appear and in what context are they attested? Does it change in the course of time? Are the different materials a question of status and prestige, or of musical importance? Do the various materials have different connotations, is one used to gain the attention of a god, and others "only" to give rhythm to dancers, singers and instruments? Are the individual materials limited to one special ritual, or do they appear in mundane contexts as well?

3 WEARING THE BRONZE, SHAKING THE CLAY: AN OVERVIEW ON METAL AND CLAY SOUNDTOOLS AND SOUNDSCAPES IN EARLY IRON AGE ITALY

**Abstract author(s):** Mungari, Pasquale Mirco - Scardina, Placido (Independent researcher)

**Abstract format:** Oral

Italic populations of Bronze and early Iron Age are still mysterious for archaeomusicologists. The lack of written sources, and the hegemony of funerary contexts among the archaeological sources as well, drastically reduces the research frame related to sounding and musical phenomena; it is only possible to analyse objects in grave goods, being them more or less related to sound production. However, in the last decade a wide reconsideration of this matter took place, allowing scholars to hypothesize something more than simple interpretations of single objects; in particular, the communicative function of several metal objects, mostly adornments and pieces of jewellery, has been clarified, as well as the function of some clay soundtools.

The analysis focuses on a remarkable number of objects, mostly in bronze but also some clay ones, discovered mainly in funerary contexts of Central and Southern Italy, specifically in Adriatic area, and in North Calabria/Basilicata and Eastern Sicily. The findings, interpretable as idiophones instruments, were used in many cases as adornments for the dresses of prestigious women buried; the acoustic potential of some of these objects was already perceivable at the time of their discovery.

This paper tries to give an updated and multidisciplinary overview about this wide corpus of objects, in a multidisciplinary context, also including recent findings and debates.

4 THE IMPORTANCE OF THE MATERIALS USED IN THE ICONOGRAPHIC REPRESENTATION OF MUSICAL INSTRUMENTS IN IBERIAN CULTURE

**Abstract author(s):** Izquierdo-Torrintera, Lidia (Universidad de Granada)

**Abstract format:** Oral

The need to study musical instruments associated with the so-called Iberian culture (6th to 1st centuries BCE, southern and eastern Iberian Peninsula) through iconography lies in the inherent problems of written sources and the scarcity of archaeological musical instruments found to date.

Nevertheless, the study of musical instruments depicted on archaeological materials presents obvious difficulties for a variety

of reasons: the techniques used in their realization, the amount of detail with which they are configured, the state of the objects vis-à-vis preservation, the stylistic conventions of the society that generated the iconography, and the limitations of the material on which they are represented. This last problem is examined here through examples associated with the so-called Iberian culture. Two-dimensional depictions and three-dimensional models of musical instruments on ceramics, rock and metal will be considered.

It is important to study not only the representations of the musical instruments in these materials but also the elements associated with them in the iconography. This allows, in some cases, to appreciate what in recent years is being studied as sound representations, such as many ceramics from Tossal de Sant Miquel de Lliria and Vaso de los Guerreros of Serreta de Alcoi and another with the same name from Cigarralejo. Apart from iconographic issues, the context in which the materials are found can provide valuable information. But just as important is the study of the materials on which the instruments are embodied, as this will reveal the importance of these instruments in different aspects of life in the Iberian world, such as celebrations of dances and/or parades, banquets, religious rituals, combats, and moments of daily life such as childhood and death.

5 GOLD, IVORY AND WOOD. LYRE'S MATERIALITY IN ATTIC INSCRIPTIONS

**Abstract author(s):** Colangelo, Eleonora (Université de Paris - Centre ANHIMA, Paris - University of Pisa; Istituto Italiano di Preistoria e Protostoria / Museo Archeologico Nazionale, Florence)

**Abstract format:** Oral

Several inscriptions from Attica show a lexical technicality in describing the decorum of musical instruments (see e. g. IG I3 343, l.14). Within these inscriptions, it is of interest to note not only the sequence of the objects (musical instruments – lyres – plus other votive or cosmetic devices), but also the progression of their adjectives (i.e. κατὰ χρυσος, ἐλεφάντινα[ι, ξύλινα]). They are related to the materiality of the instrument and represent an efficient tool to analyse the concrete and symbolic importance of the lyre materials. In this respect, the comparison with the analogous lexicon of ornaments in the Attic and Delian corpora enlightens the function of these adjectives for sound objects. Following this perspective, already announced elsewhere (COLANGELO 2018), our analysis will focus on three adjectives: κατὰ χρυσος, ἐλεφάντινος and ξύλινος. They reveal three different kinds of lyre's materiality, related respectively to its poetic, votive and more properly artisanal dimensions. The linguistic approach, applied to the study of both literary and epigraphic sources, will enable to fill the archaeological gaps concerning our knowledge of the lyre morphology (cf. BÉLIS 1989). In addition, translation problems will be addressed with particular concern for "golden compounds". How should we translate the khrosos-adjectives referring to the lyre surface? Why, how and for whom does the artisan make a lyre shine? When is gold chosen instead of ivory or wood? Does the adjectival sequence in the inscriptions correspond to an ancient scheme of classification? To answer these questions, all the ancient sources related to the lyre's surface will be compared, so as to give a more accurate account of the materials and their pragmatic, sensory and therefore symbolic importance. Finally, the value and the agency of metals and less precious materials will be analysed in comparison to other physical issues of the lyre (size and shape).

6 DIGITAL SENSORIALITY AND 3D VIRTUAL RECONSTRUCTIONS OF ANCIENT MUSICAL INSTRUMENTS

**Abstract author(s):** Bellia, Angela (National Research Council of Italy)

**Abstract format:** Oral

Virtual reconstruction of ancient musical instruments e.g., the exceptionally well-preserved instruments, auloi and lyres (VI-V c. BCE) found at Poseidonia and Metaponto, as well as the aulos found in Selinunte (under Temple R, very close to the cultic theatre), allow us to implement our knowledge on the material of these instruments. It is divided into three main tasks, namely the 3D scanning phase, the post-processing phase, and the virtual reconstruction phase. Despite the fact that these reconstructions cannot tell us unequivocally how their sounds were perceived by their ancient users and audiences, they offer the chance to break through the time barrier by reviving sound emissions and, by virtue of these methods, some of the subjective observations typically made by organologists on ancient instruments on the basis of traditional measurements: using 3D digital models combined with cutting-edge digital methods, they can be substituted by measurable parameters, opening up new perspectives for the study of sounds and the production process of instruments. This analysis will help us in defining a novel approach and methodology to the "digital sensoriality" of musical instruments and advance archaeomusicology's assessment of ancient music.

7 THE LIQUID MATERIALITY OF THE ANCIENT GREEK AULOS

**Abstract author(s):** Simone, Caleb (Metropolitan Museum of Art; Columbia University) - Armstrong, Callum (Woodwind Specialist)

**Abstract format:** Oral

This paper explores the materiality of oil in the sound production and auditory perception of the ancient Greek aulos, a double-pipe reed-mouthpiece woodwind instrument. Combining textual and cultural analysis with reconstruction and experimentation, we examine a link between the practical science of the aulos' sound production and the cultural tradition of the sound's perception.

In classical authors ranging from Pindar through Plato, auletic sound is described as having a liquid materiality characterized by pouring and flowing. In a passage exploring the dynamics of vocal sound production, the Peripatetic author of the De Audibilibus (802b) offers an anecdote from aulos playing that links this liquid aesthetic materiality with the practice of auletic sound production. The author describes aulos reeds that "have been soaked" (bebregmena) and "have drunk in oil" (pepokota to sialon) as creating the kind of homogenous, even, and smooth texture in the reed blades that produces a superior sound compared with dry reeds (xera).



Taking the author’s comment literally, we have experimented in progressive stages with soaking reconstructed aulos reeds in oil. The result—which we will demonstrate in the presentation of this paper—is indeed as the Peripatetic author describes: oil-soaked reeds give the aulos a much more coherent and smooth-sounding quality. Thus drawing connections between the practice and aesthetics of ancient Greek aulos performance, our paper offers reflections from experimentation on current aulos reconstruction efforts.

8 TIBIA ORICHALCO VINCTA: APPROACHES TOWARDS AULOS MATERIALS IN POETIC WRITING

**Abstract author(s):** Wyslucha, Kamila (Independent)

**Abstract format:** Oral

Ancient poetry, both Greek and Latin, of virtually all periods frequently refers to instrumental performance within metapoetic, genre-related imagery. This is the case, for instance, with the famous passage from Horace’s Ars Poetica (202), in which the poet ponders the changes in musical accompaniment of theatrical plays. The passage is famous as well for its employment of a rare term orichalcum that denotes the material which, in the poet’s words, bound the instrument. Manifold interpretative puzzles concerning this term also emerge with regard to other poetic phrases used to describe the material and structure of auloi.

This contribution proposes to investigate the most notable instances of reference to aulos materials in Greek and Latin poetry from Greek classical period to Early Roman Empire in order to determine their meaning, provenience and role in poetic context, as well as – if possible – relationship with corresponding performative practices. The conclusions reached by this study will be particularly relevant for the research of musical imagery in written sources, the intersections of metaphoric language and the technicalities of instrument making, and finally poetic text criticism in general.

160 SHAPING CULTURAL LANDSCAPES: CONNECTING AGRICULTURE, CRAFTS, CONSTRUCTION, TRANSPORT, AND RESILIENCE STRATEGIES. PART 1

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Pakkanen, Jari (Royal Holloway, University of London) - Brysbaert, Ann (Leiden University, Faculty of Archaeology)

**Format:** Session with keynote presentation and discussion

Any activity requires the expenditure of energy, and the larger the scale of the undertakings, the more careful and strategic planning in advance is required. In focusing on labouring by humans and other animals, this session investigates how past people achieved their multiple daily tasks while remaining resilient in anticipation of adverse events and periods. It investigates the minimum resource requirements of combined activities of conducting agriculture, crafts, constructing houses and monumental buildings, and how the available resources were employed successfully. Multi-layered data can be employed to illuminate the many interconnected networks of humans and resources that impacted on people’s day-to-day activities, but also to discuss the economic, cultural and socio-political relationships over time in different regions. We aim to discuss novel perspectives in which the landscape in its widest sense is connected to interdisciplinary architectural and/or crafting perspectives. Rural landscapes and their populace formed the backbone of pre-industrial societies. Analyses of the rural ‘hinterland’, the foci of cities and other central places (often with monumental architecture) and the communication between these are essential for the papers of this session. These different agents and phenomena and their connections are crucial to our understanding how political units functioned at several socially interconnected levels. Bottom-up approaches can dissolve “monolithic” understandings of societies, the elite-labour/farmer and the centre/rural dichotomies because the many social groups co-depended on each other, albeit perhaps in unequal measure depending on the given context.

This session aims to discuss how the landscapes were modified through building, agriculture and other activities, mobility, transportation and infrastructure, land-use and resilience strategies, and carrying capacities. We welcome case studies that investigate rural and urban populations and their interactions with their land, their built environments and their societies.

Keynote speakers: Prof. Ch. Scarre & Prof. Paul Erdkamp.

ABSTRACTS

1 MARBLE IN THE MOUNTAINS – ECONOMETRICS OF QUARRYING AND TRANSPORTING BUILDING STONES FOR MONUMENTAL ARCHITECTURE IN ARCADIA

**Abstract author(s):** Pakkanen, Jari (Dept of Classics, Royal Holloway, Univ. of London)

**Abstract format:** Oral

The best known ancient marble quarries in Arcadia are at Doliana, 13 km SE of Tegea. The marble was quarried from the Archaic period onwards and used e.g. in the fourth-century BCE temple of Athena Alea at Tegea. The source of large-crystal white marble used for roof tiles in ancient monumental architecture in Arcadia has been argued to originate in the Mani in the southern Peloponnese. Local stones were also employed, such as the conglomerate in the foundations of the temple of Athena Alea. The cost of quarrying in ancient Greece has not been studied in sufficient depth so far and the paper will make a contribution to this field. The volumes of materials can be estimated on the basis of architectural studies and currently also 3D-documentation of the remains. The transport of white roof tile marble very likely combined shipping with hauling by oxen and wagons. The paper will look at the labour rates of

quarrying the different stones and the potential transport routes and costs to assess the economic impact of the different options.

2 MATERIAL AGENCY AND RESILIENCE: NEW APPROACHES TO THE MARBLE QUARRIES OF ANCIENT TEGEA

**Abstract author(s):** Bakke, Jørgen (University of Bergen)

**Abstract format:** Oral

Builders from the Ancient Greek city-state Tegea used marble from an ore in the Northern Parnon range in the Peloponnese already around 600 BC, and the ore was probably extensively exploited throughout Greco-Roman Antiquity. The urban site of Tegea is situated on the Tripolis Plain at an altitude of between 650 and 700 meters and the Tegean marble quarries near the mountain village Doliana at between 900 and 1200 meters. Previous discussions of the Doliana quarries have viewed them as passive natural resources that was exploited locally at Tegea and to some extent also exported to neighbouring city-states during the peak of classical Greco-Roman civilization. This paper will explore the potential of approaching the Tegean quarries in view of material agency and resiliency theory. Rather than as a passive source that was exploited by established settlements and rural institutions the paper focuses on how as material agent the Doliana marble ore contributed to the location and shaping of settlements, rural institutions and interconnected networks in the region. The paper relies on fieldwork undertaken in the Doliana quarries in 2012, but the main objective is to portray the active role of the marble quarries in the establishment of rural sanctuaries, communication networks, and interconnected networks from the Bronze Age to Late Antiquity. In order to relate the material agency of the Doliana quarries to resilience theory there will be special focus on the formative, and transformative phases of the region such as the Bronze Age and Late Antiquity rather than on the peak of classical Greco-Roman civilization when urban centers, rural institutions and interconnected networks were well established.

3 DID BUILDING CONTRACTORS WORK FOR FREE? STONE SUPPLY IN 4TH CENTURY EPIDAUROS

**Abstract author(s):** Vanden Broeck-Parant, Jean (University of Utrecht)

**Abstract format:** Oral

During the 4th century BC, several new buildings were constructed in Epidauros as part of an effort for monumentalizing the sanctuary of Asklepios. The operations are recorded in inscribed accounts which show that the local authorities in charge of these works let out contracts to entrepreneurs from various places such as Corinth, Argos and Athens. These contractors were responsible for quarrying, transporting and assembling the stone blocks. A single contractor was often in charge of several of these operations. Little has been said about the status of these entrepreneurs. It has been suggested that they were not driven by the search for profit, rather that they were probably wealthy citizens willing to help their city by giving up their own profit as a form of benefaction. This paper aims at investigating further the question of the status of these entrepreneurs by looking at the expenses involved in quarrying and transporting the stone blocks on both land and water. Estimating the actual costs of these operations and comparing these costs with the contract prices recorded in the inscriptions allows a more objective approach to the issue of the profitability of such operations for the contractors, and thus, to their social status. The calculation is based on labour cost estimation methods and on epigraphic and literary evidence, taking into account the wages for the workers and for the staff, the maintenance of tools and infrastructure, the renting of the quarry and of the transportation means, as well as risk management and potential fines. Such an approach sheds light on the strategies that were used by the contractors for making the most of the available resources, minimizing the risks and optimizing the expenses.

4 LABOUR AND MOBILITY IN IRON AGE RURAL LANDSCAPES: AN ARCHAEOMETRIC STUDY OF CERAMICS FROM EL CASTRU IN VIGAÑA (ASTURIAS, SPAIN)

**Abstract author(s):** de Groot, Beatrijs (The University of Edinburgh) - Gonzalez Alvarez, David (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC)

**Abstract format:** Oral

Asturias is a mountainous region of NW Spain where communities inhabited ‘castros’ or hillforts during the Iron Age. Societies in this region predominantly relied on a diversified agrarian economy combining agricultural and herding activities. These groups have recently been characterised as ‘deep-rural’ societies – broadly self-sufficient communities with domestically produced and monotonous material assemblages, resilient to the hierarchical social and political organisation models we can observe in other areas within NW Iberia (Gonzalez Ruibal 2012). However, an archaeometric study of Late Iron Age ceramics from the hillfort of El Castro in Vigaña (Asturias, Spain) has shown that ceramics used by the inhabitants of this site were probably transported across significant distances through the mountainous surroundings. This evidence may imply that pre-Roman communities were less isolated than previously assumed, which is all the more surprising considering that zooarchaeological, carpological and archaeometallurgical evidence collected at the site reveals a local and self-sufficient small community of highlanders.

This presentation will consider the mobility of Iron Age communities in the study area by tracing the circulation of raw materials for ceramic production. It will compare this to patterns of mobility deriving from tentative evidence for short-distance transhumance and agriculture, as well as interregional interactions more broadly. It will also consider shifts in labour economies brought about by the introduction of the fast potter’s wheel and workshop production during the Roman period, assessing the impact of technological change on the day-to-day lives of the inhabitants of this region.



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By addressing the complexity of components, relating to craft production, subsistence and mobility that characterise the rural economy of this region, this presentation contributes to revising monolithic views on the organisation of rural societies of Iron Age communities in NW Iberia.

### A CROSS-CRAFT APPROACH OF CERAMIC, GLASS AND IRON IN THE EARLY MIDDLE AGES. THE RESOURCES OF WORKSHOPS FROM SOUTHERN BELGIUM

**Abstract author(s):** Van Wersch, Line (ULiège) - van Haperen, Martine (Leiden University) - Pagès, Gaspard (CNRS)

**Abstract format:** Oral

In northwestern Europe, the early Middle Ages correspond to a deep social and economic change. Currently, the elite is seen as the leader of the economy and the main driver of change but the role of artisans deserves to be reassessed, particularly through its material remains. Pyrotechnologies that have left few written traces, have long been neglected. Until Henning’s work , there was no systematic analysis of the archaeological sources. Little attention is still paid to where artisans obtained their resources, the techniques they used, to their networks and to the social and physical landscapes in which they operated.

During the early Middle Ages, ceramics, glass and iron also underwent profound transformations. The production places moved from the agglomerations and rural settlements to the aristocratic domains, monasteries and emporia. At the same time, major technical changes took place that fundamentally altered the modus operandi of these crafts. The factors involved in these transformations are still largely unknown. Crossed-craft interactions and artisan networks could very well have been key triggers of innovation.

We propose to approach these crafts and their interactions using their respective “chaînes opératoires”, identifying potential opportunities for cooperation, sharing of resources and innovation. These models will then be combined with the locations of raw materials and those of the secondary workshops discovered in Belgium, the heart of the Merovingian and Carolingian Empire.
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### HUMAN-WATER INTERACTION AND ITS IMPACT ON SOCIETY AT LE QUARTIER DU THÉÂTRE, DELOS, DURING THE LATE-HELLENISTIC PERIOD

**Abstract author(s):** Klingborg, Patrik (Swedish Institute at Athens)

**Abstract format:** Oral

Access to water is essential for the formation and continued sustainability of human societies, modern as well as ancient. Due to this, water sources and use points form important nodes in both urban and rural landscapes, shaping, and in turn being shaped by, human behaviour. Yet, studies concerned with the water supply in ancient Greece, and especially water usage, has focused almost exclusively on the impact of monumental structures such as public fountains and aqueducts. In practice, however, the vast majority of the population relied on considerably less impressive installations such as wells and cisterns. Consequently, current knowledge about water collection and usage, and in particular how this affected society is severely skewed. Considering this lacuna the current paper aims to explore the physical and social resources used to access water in ancient Greek urban landscapes. To do this, water access and use points functioning as nodes, with a focus on wells and cisterns, at insulae II–IV and VI in Le Quartier du Théâtre on the island of Delos will be used as a case study. Who had access to water and from which source(s)? How and when was water accessible, and how did this affect the performance of daily and occasional activities? How did the need for water create and affect movement patterns? In conclusion the paper will propose that the complex water supply system at Delos contributed significantly to the formation of the social fabric through its capacity to generate interactions. Simultaneously the diverse nature of available sources in combination with the social stratification in terms of access and control created a physically resilient, but socially fragile, water supply system on the island.
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### MONUMENTS, SOCIETY AND LANDSCAPE IN PREHISTORIC EUROPE

**Abstract author(s):** Scarre, Chris (Department of Archaeology, Durham University)

**Abstract format:** Oral

Monuments vary widely in scale, from modest cairns, timber posts or stone pillars raised by hunter-gatherer and pastoralist communities, to the impressive labour-intensive projects associated with early states. The latter reveal how major projects of monument construction could be associated with the creation and consolidation of power structures, demonstrating the ability of élites to mobilise large labour forces. Prehistoric monuments, conversely, such as those of Neolithic western Europe, may generally have been within the scope of individual communities to construct, and need not imply the existence of embedded social hierarchies. A recurrent feature is the role of megalithic blocks, generally local in origin, but sometimes brought from considerable distances. Given the size of the blocks – the largest weighing over 100 tonnes – that implies the existence of social structures capable of bring together and co-ordinating the substantial numbers of people who would have been required. In Neolithic western Europe, it may indicate that the blocks themselves had special importance, and that they had symbolic or religious significance.

By contrast, the materials buried with the dead were usually relatively modest in scale. Only rarely were buried individuals furnished with more elaborate grave assemblages that imply prestige and indicate long distance contacts. Notable examples include north-west France in the mid/late 5th millennium BC, and southern Iberia in the 3rd millennium BC. While these exceptional examples may imply the rise of powerful individuals, they did not in either case lead to the establishment of enduring patterns of social complexity. Indeed monumentality, and the construction of very large monuments in particular, had a variable relationship to the cycles of social

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change that characterised prehistoric and early historic societies.

### COMBINED METHODOLOGIES AND ANALYSES OF THE ROAD NETWORK DURING THE LATE BRONZE AGE ARGOLID, GREECE.

**Abstract author(s):** Brysbaert, Ann - Vikatou, Irene (Leiden University)

**Abstract format:** Oral

In the LBA Argolid, Greece, monumental architectural remains comprised of citadels, tholos tombs, fortification walls, and engineering works such as roads, bridges and culverts, and dams. Some of the main road remains exhibit a clear correlation between building activities and the exploitation of material, human and animal resources. The known Mycenaean highways were, however, far from the only communication ways that linked places in the region since these focus mainly on their monumental make-up and any remains alongside them. Many other lesser roads and paths were in use as well, and possibly for much longer periods of time, so well before the Mycenaean period and also beyond that. Therefore, can we reconstruct any of these lesser roads and paths in the region, and how? To what extent did a more comprehensive road network contribute to the development of different types of settlements, only some of which turned into the dominating centres of the 13th-12th centuries BCE? How did the construction of these roads impact on the available labour? Combining spatial and social network analysis with the use of FOSS (Free Open Source Software, s.a. QGIS, Nodegoat, Opentopo), and field walking, we aim to illuminate the advantages of implementing methodologies that verify, complement, and evaluate each other. In this paper we pay specific attention to the full integration of QGIS into Nodegoat and the temporal and other benefits it brings to our analysis. Since FOSS is constantly developing, our applied methodologies are fully transparent, reproducible and also expandable. In addition, labour cost calculations are carried out for all known Mycenaean highways. As such we aim to reconstruct a fuller picture of the mobility patterns of multiple resources and people during the final centuries of the LBA in the Argolid prior to the demise of the Mycenaean societies.
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### BUILDING THE THOLOS TOMB IN TIRYNS: COMPARATIVE LABOUR COSTS AND FIELD METHODS

**Abstract author(s):** Brysbaert, Ann - Turner, Daniel - Vikatou, Irene (Leiden University) - Pakkanen, Jari (Royal Holloway, University of London)

**Abstract format:** Oral

In the Middle and Late Bronze Age Aegean mainland, tholos tombs became a typical grave type for those who could afford to execute these, often monumental, burials. While the phenomenon started in Messenia, the largest ones were constructed in the Argolid: Mycenae featuring nine in total. This paper discusses the labour efforts and methodologies employed in the study of one of two tholos tombs found at the nearby site of Tiryns. This large tholos, located east of Tiryns’ citadel, was excavated and published by the DAI in the early 20th century (Müller 1975). Their drawings, combined with new fieldwork carried out in 2018, form the core data for this paper. In overlaying the scanned existing drawings over the 3D model produced by photogrammetry, we compare the accuracy of modern fieldwork techniques in collecting 3D data with much older produced drawings and assess whether the differences are significant to the final results. Next, we investigate, by means of architectural energetics or labour cost studies, how much effort went into the construction of this grave monument and what its potential impact on the available labour may have been. The data collected indicate that the stones employed in constructing this tomb were collected nearby, directly from the hill in which the tomb was dug and cut. At least two main types of recognizable limestone were used while no conglomerate featured anywhere in the tomb stomion, in contrast to most other nearby tholoi of the same period and the clear presence of conglomerate in the citadel. The door jambs of the stomion were embellished with plaster, possibly painted, a feature also noted on various other tombs of this period. Labour calculations will cover all materials and employ a relative index comparing the cost with that of other standard tomb types in southern Greece.
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### SHAPING A MYCENAEAN CULTURAL LANDSCAPE AT KALAMIANOS

**Abstract author(s):** Pullen, Daniel (Florida State University)

**Abstract format:** Oral

The short-lived Mycenaean harbor settlement of Kalamianos and its hinterland, on the Saronic Gulf of the Aegean, were the focus of a “colonization” effort by the Argolid elites as they expanded their economic and political interests into the Saronic Gulf in the Late Bronze Age. A large outlay of capital and labor into infrastructure rapidly transformed what had been a peripheral, sparsely settled region in the Early Bronze Age into a Mycenaean cultural landscape with a walled urban settlement featuring elite style architecture, satellite settlements, and many hectares of agricultural terraces. In this paper I explore the social exploitation of this newly created cultural landscape, suggesting that there were multiple strategies to cope with the realities of living here, from the small-scale to region-wide.

The construction program indicates involvement by elites who could command resources. While the extensive terracing demonstrates the newly founded town was intended to be at least partially self-sustaining, these were insufficient to supply the daily food needs of the urban population at Kalamianos. The town was founded to be a port to compete in the increasingly interconnected market system within and beyond the Saronic Gulf. Ceramic analyses show that Kalamianos did not produce its own pottery, but, rather, imported pottery the ceramics from other areas of the Saronic Gulf such as the Corinthia, Attica, and Aigina – though not from the Argolid. Architectural studies at Kalamianos indicate the presence of workshops and storage facilities, though we do not know what

Kalamianos offered in exchange. This procurement pattern indicates that merchants and markets helped supply some of the needs of Kalamianos independent of the presumed connection with the Argolid centers. Merchants and markets are social strategies that operate in networks alongside and independent of centralized power and economic control by elites.

11 LANDSCAPE, POWER AND ECONOMY IN THE WESTERN MEDITERRANEAN LATE BRONZE AGE-EARLY IRON AGE (C. 1150-600 BCE)

**Abstract author(s):** Gorgues, Alexis (University of Bordeaux Montaigne; UMR 5607 Ausonius)  
**Abstract format:** Oral

Archaeological interpretation is often teleological. There is a tendency to analyse a phenomenon according to its final result. For example, the centuries preceding the emergence of cities will be described as a time of "proto-urbanization". The archaeology of the late 2nd/early 1st millennium B.C. in the western Mediterranean is a good example of such a perspective: this period is often presented as a period of transition, ultimately leading to the definitive adoption of the "Classical" landscape, structured around central places (cities), dominating politically as well as economically the surrounding rural areas. Such a model implies a massive concentration of power(s), know-how and information in specific places, reducing the surrounding landscape to an area of production of staple products.

Yet, if we get rid of the evolutionary perspective, the Western Mediterranean around 1000 BC appears as a place where many different types of relationships between landscape, power and economy were experienced. Through case studies carried out throughout the entire Western Mediterranean basin (i.e. today western Italy, eastern Spain and southern France), we will try to highlight different models of organisation that were not of a "transitory" nature. On the contrary, they were the material and spatial expression of the different social structures operating at this time. We will discuss the nature of these social structures and show how they endured, sometimes until the Roman period.

12 THE CONSTRUCTIONS OF THE COMMUNITY OF THE HEUNEBURG DURING THE FIRST PART OF THE 6TH CENTURY

**Abstract author(s):** Remise, François (EPHE)  
**Abstract format:** Oral

Between 600 and 540 BC, along the Upper Danube valley in southwestern Germany, the community of the Heuneburg grew around an upper town and a lower town protected by mudbrick fortifications, surrounded by an outer settlement divided into quarters by a system of banks and ditches.

This community constructed fortifications, large earthworks, housings and agricultural buildings. Some of these constructions had to be rebuilt or modified during the period, or at least maintained, while conducting agricultural and artisanal activities necessary to the economy.

Which organisation did this community implement ?

In this paper, I present a detailed analysis of the labor and time spent to construct all these projects, choosing the most appropriate task rates, from the supply of raw materials to the finishings, among dozens to hundreds of published values for each task. Based on the results obtained, several scenarios were considered and schedules have been worked out, taking into account the labour force estimation and the time required for these constructions and activities.

161 SHAPING CULTURAL LANDSCAPES: CONNECTING AGRICULTURE, CRAFTS, CONSTRUCTION, TRANSPORT, AND RESILIENCE STRATEGIES. PART 2

**Theme:** 1. Networks, networking, communication: archaeology of interactions  
**Organisers:** Brysbaert, Ann (Leiden University, Faculty of Archaeology) - Pakkanen, Jari (Royal Holloway, University of London)  
**Format:** Session with keynote presentation and discussion

Any activity requires the expenditure of energy, and the larger the scale of the undertakings, the more careful and strategic planning in advance is required. In focusing on labouring by humans and other animals, this session investigates how past people achieved their multiple daily tasks while remaining resilient in anticipation of adverse events and periods. It investigates the minimum resource requirements of combined activities of conducting agriculture, crafts, constructing houses and monumental buildings, and how the available resources were employed successfully. Multi-layered data can be employed to illuminate the many interconnected networks of humans and resources that impacted on people's day-to-day activities, but also to discuss the economic, cultural and socio-political relationships over time in different regions. We aim to discuss novel perspectives in which the landscape in its widest sense is connected to interdisciplinary architectural and/or crafting perspectives. Rural landscapes and their populace formed the backbone of pre-industrial societies. Analyses of the rural 'hinterland', the foci of cities and other central places (often with monumental architecture) and the communication between these are essential for the papers of this session. These different agents and phenomena and their connections are crucial to our understanding how political units functioned at several socially interconnected levels. Bottom-up approaches can dissolve "monolithic" understandings of societies, the elite-labour/farmer and the centre/rural dichotomies because the many social groups co-depend on each other, albeit perhaps in unequal measure depending on the given

context.  
This session aims to discuss how the landscapes were modified through building, agriculture and other activities, mobility, transportation and infrastructure, land-use and resilience strategies, and carrying capacities. We welcome case studies that investigate rural and urban populations and their interactions with their land, their built environments and their societies.

Keynote speakers: Prof. Ch. Scarre & Prof. Paul Erdkamp.

ABSTRACTS

1 MAKING ISLANDSCAPES IN SOUTH VANUATU

**Abstract author(s):** Flexner, James (University of Sydney) - Bedford, Stuart (Australian National University) - Valentin, Frederique (CNRS)  
**Abstract format:** Oral

The archaeological record of the South Pacific contributes to a broader story of the ways that people have adapted to island and coastal environments in the past. Key themes include the transformation of small islands to accommodate agricultural intensification; use and management of marine resources; political adaptations to circumscribed environments; and the importance of exchange to mediate kinship and trade relationships. Rather than separating land from sea, these kinds of environments lend themselves to the creation of 'landscapes', integrating the terrestrial and maritime worlds as people adapted to a geographic region dominated by ocean. Over a 3000-year period, Pacific Islanders have shaped the land and seascapes of southern Vanuatu. This paper presents the results of four years of intensive archaeological survey in the south Vanuatu region, focusing on the islands of Tanna, Futuna, and Aniwa. These islands had seen limited archaeological study in the 1960s and much of their archaeological histories remained unknown prior to our research. Survey and excavations have now recovered evidence for Lapita and post-Lapita ceramic traditions and settlement; investment in large-scale agricultural and marine resource management strategies; and interaction with and integration of outsiders, including Polynesian settlers around 1000CE and European Missionaries in the 1800s.

2 TEOTIHUACAN: EXPLORING URBAN BUILT ENVIRONMENT

**Abstract author(s):** Torras Freixa, Maria (Universitat de Barcelona)  
**Abstract format:** Oral

Ancient urban settlements offer a framework to discuss human-environment interactions and the communication between rural and urban sectors within societies. The primary aim of this contribution is to explore the city's growth of Teotihuacan and how affected this development to its hinterland.

The highland city of Teotihuacan, c. 1-650 CE, was unique in contemporary Mesoamerica, for its size and a carefully designed grid plan dominated by large-scale buildings. During the formation and monumentalization period (c. 1-250 CE), the settlement achieved a high degree of urban planning visible in a coordination and standardization among buildings and spaces. In addition, the transformation process of the whole city intentionally destroyed agricultural soils and abandoned irrigation systems for urban purposes. The expansion of the built environment to the detriment of agricultural production seems to support the thesis of an empowerment of rulership and a successful control over new rural landscapes, since the city continued to grow. In sum, Teotihuacan's growth shows the symbiosis between the city and its rural 'hinterland' and a possible strategic planning in advance by groups who have the power to shape this urban landscape in a top-down creation process.

3 SACRED MOUNTAIN IN THE RURAL LANDSCAPE. SIGNIFICANCE OF TETZCOTZINCO FOR THE CITY OF TETZCOCO -"CENTER-PERIPHERY" RELATIONSHIP IN THE AZTEC EMPIRE

**Abstract author(s):** Prusaczyk, Daniel (University of Warsaw)  
**Abstract format:** Oral

Tetzcotzinco is one of the best-preserved "rural residences" of the Aztec rulers in Mexico and is one of the few remains of the activity of the city of Tetzco, one of the most important centers of the Aztec Empire. Despite numerous studies, none of the researchers attempted to understand the relationship between the central city and the peripheral Tetzcotzinco, which is still only considered as "the gardens of the rulers of Tetzco". It is only our recent, broad-context research that aims to understand the importance of Tetzcotzinco as a Tetzco's hinterland, and the role of the Aztec cultural landscape in both the economy and worldview.

The aim of the paper is to present studies aimed at understanding the relationships between the "rural" landscape of Tetzcotzinco and the city of Tetzco. Our research shows, among others economic relationships between the two centers. Tetzcotzinco, where an elaborated hydraulic system was discovered, was probably the largest and most important freshwater reservoir in the area. Numerous reservoirs and canals provided water not only for the "gardens" of Tetzcotzinco, but also distributed it to distant cultivated fields. At the same time, the localization of Tetzcotzinco in the regional road network may indicate the use of this place as a "stop" for merchants in far-reaching trade. The last important issue will be an attempt to answer questions about the exploitation of Tetzcotzinco in various areas of the economy. According to our research, this place was a cross between agriculture and trade, construction and crafts. In-depth landscape research show how the city of Tetzco was supplied with water or food, and on the other hand, how Tetzcotzinco was used as a place for craftsmanship under the control of their ruler.

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The whole analysis can help in understanding the complex "center-periphery" relationships in the Aztec world.

### TOWNS IN A SEA OF NOMADS: TERRITORY AND TRADE IN MEDIEVAL SOMALILAND

**Abstract author(s):** de Torres Rodríguez, Jorge (Incipit - Institute of Heritage Sciences)

**Abstract format:** Oral

Between the 11th and the 16th centuries AD, the south-eastern half of the Horn of Africa was home to a number of Muslim states which extended their authority over very diverse geographical and ethnically regions, providing stability for trade and challenging the powerful Christian kingdom of Abyssinia to the north. They also acted as one the key actors of the international trade which connected the interior of Africa with the Mediterranean region, Middle East and Asia. Based on the six years of research of the Spanish Archaeological Mission in Somaliland, this paper will explore the archaeological evidences of the diverse ethnic groups, religions and lifestyles which inhabited these Muslim medieval kingdoms, and the ways in which these communities interacted among them and with the state structures. Using the example of nomads, urban dwellers and foreign merchants in western Somaliland, it will present an interpretation of how these interactions could have taken place, from the trading posts of the Somaliland coast to the agriculture-based settlements of inner Somaliland, as well as the elusive but widespread nomadic archaeology. It will also analyze the processes of emergency and consolidation of states throughout the Horn of Africa, both in the Somali region and the Ethiopian highlands, and the role they played in regional and international contexts during the Middle Ages and Modern Ages.
- 5

### AFTER THE COLLAPSE. AN INTERDISCIPLINARY CONTEXTUALIZATION OF THE RISE OF NAACHTUN (GUATEMALA).

**Abstract author(s):** Hiquet, Julien (UMR 8096 ArchAm) - Castanet, Cyril (LGP UMR 8591) - Dussol, Lydie - Purdue, Louise (CEPAM UMR 7264) - Nondédéo, Philippe (UMR 8096 ArchAm) - Tomadini, Noémie (UMR 7209 AASPE)

**Abstract format:** Oral

At Naachtun, a Classic Maya regional capital north of Petén, Guatemala, the Early Classic period (CE 150-550) was an apex of monumental construction. The epicenter with its temples and pyramids was built on man-modified hilltops, at a great expense of stone and lime. Just after the so-called "Preclassic Collapse", circa CE 150, which saw the abandonment of a very elaborate system of massive cities, the Maya Lowlands erected again conspicuous and impressive buildings. In this presentation, we combine a quantified and detailed study of Early Classic monumental architecture at Naachtun, an estimate of local population, and a thorough study of local resources use (water, wood, soils, crops, and fauna) at small and larger scales (epicenter and micro-region) to envision the management of the local environment in the context of the rise of the Classic Maya political entities, framed by two regional collapses, in the Late Preclassic and in the Terminal Classic (CE 750-950) periods. Questions of resources management in a context of growing consumption for subsistence and architecture are, then, central in our understanding of the local dynamics. Haunting is the question of the rise of Naachtun at the exact moment of the dramatic decline of the neighboring cities of the Mirador region, a decline explained by some scholars through the overexploitation of the local environment. Are we to consider the Maya had a predatory behavior, exhausting a region, and then starting again in the nearest exploitable place until the next crisis? What environmental data tell us more about sustainability and long term management? The local human-environment dynamics were probably the result of a very complex and probably unstable balance, more or less controlled by local populations.
- 6

### CLASSICAL AND HELLENISTIC POTTERY KILNS FROM GREEK AREAS IN THEIR NATURAL AND HUMAN LANDSCAPES

**Abstract author(s):** Tomei, Francesca (University of Liverpool)

**Abstract format:** Oral

The wider landscape, both natural and human, played an important role in pottery production processes during Classical and Hellenistic periods.

Therefore, in this research, I am focusing on the firing stage of pottery production and I am investigating how kiln sites in Greek areas (in particular, Southern Italy) related with their broader landscape settings. Pottery kilns needed a wide range of natural resources from clay to build the kiln (and pottery making) to fuel for firing, which according to ethnoarchaeological sources should be available in the closest area, according to what topography, geology and geomorphology offered. The locational choice of kiln sites was then largely influenced by environmental features of the geographical area considered. At the same time, resources as well as ceramics products needed to be transported to and from production sites, so the proximity of roads or communication routes was essential.

Combining geospatial analysis through GIS with archaeological and ethnoarchaeological data, I focus on how pottery kiln sites fit in their local natural and socio-economic landscape in consideration of their spatial location and products manufactured. I also make comparisons between kiln sites in the countryside (eg., chora of Metaponto) and in the main urban centre (eg., the kerameikos of Metaponto asty), where resource gathering and the destination of use of pottery might have been different.

- 7

### TWO MILLENNIA OF AGRICULTURE AND LANDSCAPE CHANGES IN THE SABOR VALLEY (NE PORTUGAL): A VIEW FROM THE ARCHAEOBOTANICAL RECORD

**Abstract author(s):** Tereso, João (CIBIO - Research Center in Biodiversity and Genetic Resources, Univ. of Porto; Centre for Archaeology. UNIARQ. School of Arts and Humanities. University of Lisbon; MHNC - UP - Natural History and Science Museum of the University of Porto) - Vaz, Filipe - Seabra, Luís (CIBIO - Research Center in Biodiversity and Genetic Resources (Univ. of Porto)

**Abstract format:** Oral

Archaeological and archaeobotanical data recently obtained in the Sabor river Valley (NE Portugal) revealed profound changes in the area from the Bronze Age to the Roman Period. These changes were perceived both in the shifting trends in the human occupation of the valley as well as in agricultural practices, despite the continuing presence of some crops throughout these two millennia.

Bronze Age communities occupied the areas near the river as agricultural fields and burial places. Large settlements were absent and only a few seasonal sites were identified, mainly consisting of negative structures (pits). During the Iron Age, wider residential areas were constructed in the valley, as well as a large centralized and fortified storage area (Castelinho), which may have had a relevant regional role in the protection and redistribution of cereals. With the onset of Romanization, new models for the exploitation of the territory were implemented in the valley, deeply shaping its landscape and the economy of its inhabitants. Several small farms were built to produce wine and/or olive oil for trade while maintaining the cereal production.

The ample archaeobotanical record available, comprised of seeds/fruits and charcoal assemblages from a dozen archaeological sites, in combination with other data provides an invaluable opportunity to address these changes. This paper will rely on this data to reflect on the main trends in agriculture and landscape as well as how human communities related with their land and incorporated new ideas through time.
- 8

### CLIMATE, CARRYING CAPACITY AND SOCIETY: THE QUEST FOR UNIVERSAL TRUTHS

**Abstract author(s):** Erdkamp, Paul (Vrije Universiteit Brussel)

**Abstract format:** Oral

Population trends are linked to temperature, with falling population in colder periods and rising population during a warming trend. At least, it is proposed as a universal truth for pre-modern societies that the rise and fall of carrying capacity, and thus population, went hand in hand with climate. The debate concerning the impact of climate change on societies has accentuated the different approaches to the process of societal change among different scholarly disciplines. Some disciplines seek universal Laws that govern societal change, while others, in particular historians, question the validity of such general truths. The axioms of social sciences, archaeology and history have coloured to a large extent the debate on environmental factors versus human agency. Few scholars would nowadays disagree with the dismissal of monocausal environmental determinism, but this does not solve the debate on the role we assign to human agency in the response to climate change and on the scope for divergent paths among past societies. "Resilience, adaptation, and transformation are complex issues", it has recently been noted (Haldon and Rosen 2018). Undeniably true, but do models of societal change, such as 'Formal Resilience Theory (Theory of Adaptive Change)', which imposes a fixed cycle on past societies, really bring us forward? Prehistoric populations, it is often claimed, comply to the link between population and temperature, but western European societies during the Little Ice Age – despite its unclear chronological boundaries arguably the coldest spell during the last millennia – did not. The balance between environment and institutions (in its broadest sense) varied between societies. This does neither imply a teleological trend, nor does increased resilience mean that societies were deliberately and unitedly working for the common good. The role of socio-economic and cultural factors, a historian would argue, contradicts universal truths.
- 9

### HOW RESILIENT WERE ROMAN CADASTRES? THE CASE OF THE PONTINE CENTURIATION

**Abstract author(s):** Haas, Tymon (Leiden University)

**Abstract format:** Oral

Traces of Roman cadastres (centuriations) are still visible in many rural landscapes in the Mediterranean and beyond. Having survived for so long and indeed having structured the subsequent development of rural landscapes, they can be considered as highly resilient. However, this does not mean that in their original setting they were equally successful in enabling prolonged agricultural production. In fact, their very scale implies they could only continue to function if centralised investments in their maintenance were sustained over long periods of time. This paper explores this issue on the basis of on-going research on the centuriation in the Pontine plain, where a combination of archaeological field survey, remote sensing analysis and geo-archaeological research allows us to link changes in settlement, agriculture and landscape to the use history of the centuration system and broader socio-economic changes taking place in the context of Roman expansion between the 4th and 1st centuries BC.
- 10

### ECONOMIC AND SOCIAL NETWORKS IN IMPERIAL SOUTHERN ETRURIA - NEW OBSERVATIONS ON THE SUBURBIUM OF ROME

**Abstract author(s):** Pasieka, Paul (Johannes Gutenberg-Universität Mainz)

**Abstract format:** Oral

The extension of the suburbium of the city of Rome, which encompasses amongst other things a religious, juridical, economic, and



THE AGRICULTURAL HINTERLAND OF AQUINCUM AND BRIGETIO. LANDSCAPE, RURAL SETTLEMENTS, TOWNS AND THEIR INTERACTIONS

Abstract author(s): Simon, Bence (Institute of Archaeological Sciences - Eötvös Loránd University, Budapest)

Abstract format: Oral

Roman cities were sustained by their agricultural hinterlands, therefore their economic well-being cannot be examined apart from their adjoining rural landscape which is in focus of my paper. Soon after the Roman conquest of Pannonia, cities emerged as administrative and economic regional centres, through which the state raised taxes to cover its expenses and secure the local supply of the stationed military. In this paper I present how this economic pressure manifests in the archaeological record, especially by examining the role of physical space, natural environmental factors, and the socio-economic system in the evolution and forming of the settlement pattern in the hinterlands of Aquincum (Óbuda, Hungary) and Brigetio (Komárom-Szöny, Hungary). How can the archaeological record indicate regional and local interactions between towns and their hinterlands? How did the hinterlands’ settlement pattern change throughout the 1-3rd century? Why did certain places survive, while others reorganized after crises and what part did the natural environment play in this? These questions will be answered with the critical evaluation of find material and the assistance of a GIS-based agricultural potential model. When a city was closer to a rural settlement the more it had shaped its social, cultural and economic life. Based on the economic geography works of T. Bekker-Nielsen (1989) and J. Bintliff (2002), the epigraphic material, and the examined rural settlement pattern the immediate hinterland of Aquincum can also be precisely determined. This immediate hinterland bears the economic and social footprint of this important Pannonian city even more, as its importance lies in its prominent role in the economic sustainment of the city and the legionary camp on the Danubian ripa.

NEWLY EXCAVATED ROMAN VILLA RUSTICA IN THE TERRITORY OF RATIARIA – SUBSTANTIAL ELEMENT IN THE LANDSCAPE OF LOWER DANUBIAN LIMES

Abstract author(s): Dimitrov, Zdravko - Danov, Atanas (National Archaeological Institute with Museum)

Abstract format: Oral

The landscape archeology in Bulgaria has been developing significantly in recent years. In that direction one of the most important discoveries was the newly found rural complex in the Lower Danubian limes area near the present day town of Vidin. In 2019 along the new pipeline (Balkan Stream) construction archaeologists excavated a new complex of villa rustica. It is in the territory of the Roman military center and colony Ratiaria.

The whole complex is in the agricultural fields, near Gramada town, Vidin district, just 25 km in a straight line from the ancient center of Ratiaria.

Villas in the Roman Empire were essential elements of the economy, especially in the complicated system of the limes. Therefore, the discovery is of great importance and its presentation in the session on the development and studying of the landscapes of the Roman Empire is important.

During the five-month excavations, a representative building, several workshops, materials and finds related to agricultural activity and a huge necropolis were excavated.

Among the most interesting complexes is the necropolis of the complex. It has 42 graves, absolutely preserved in situ. The necropolis is ritual, with a clear predominance of the cremated individuals (28 graves) over the inhumed (14 graves) in a 2:1 ratio. Cremations were not performed on the spot. Some other interesting fact is that only infant individuals were inhumated.

The burial facilities are varied: built with tegulas, with stones and ordinary burial pits. The grave equipment is represented by: costume items, household ceramics, lamps, jewelry and numismatic units.

The archaeological materials are mostly dated to the epoch of Severan Dynasty – the first third of the 3rd c. CE.

The case of this newly found villa rustica is one perfect option to study all elements of the landscape archaeology in context of Roman Danubian Limes.

SUPPLY SYSTEMS ON THE DANUBE LIMES AND IN ITS HINTERLAND – THE CASES OF NICOPOLIS AND NOVAE IN MOESIA INFERIOR

Abstract author(s): Diers, Lina (Austrian Academy of Sciences)

Abstract format: Oral

The site of Novae on the middle Danube Limes comprises one of the earliest and largest urban settlements in Moesia (Inferior). It was initially installed as a legionary garrison in AD 45 and urbanisation processes and decisive growth to an extent of up to 80 hectares of civilian settlement size were set in motion in Flavian and Trajanic times. Clearly, Novae was a social and economic centre from Flavian times onwards, and its development potential can surely be traced back to the long-term military presence. Nicopolis ad Istrum, on the other hand, was a civilian ex-novo foundation of Trajan that was installed around 60 km south of Novae along the river Yantra. Three ceramic production sites (Pavlikeni, Butovo, Hotnica) were located in the direct hinterland of Nicopolis. These sites partly existed prior to the official installation of the settlement and may, therefore, be viewed as primary initiators for a permanent and institutionalised Roman presence in the Yantra basin.

The large-scale productions of coarse and fine wares at Pavlikeni, Butovo, and Hotnica were clearly geared towards serving regional markets, as their commodities have frequently been found in Novae. This raises questions of the exact functioning of regional supply systems and the interdependence between settlement emergence, urban development, and economic ventures as well as necessities. Problematically, however, the relationship between Nicopolis, its territory and the pottery production sites has not become sufficiently clear so far. Trying to grasp this relationship using data from both Novae and Nicopolis, this paper discusses approaches to narrowing down flow patterns within regional economic systems and grasping the significance of centrality, landscape, and urban settlement in these systems by investigating consumption modes and transport routes.

MEDIEVAL OBJECTS, MATERIAL CULTURE APPROACHES, AND CROSS-DISCIPLINARY DIALOGUES

Theme: 5. Theories and methods in archaeology: interactions between disciplines

Organisers: Fleming, Robin (Boston College) - French, Katherine (University of Michigan) - Effros, Bonnie (University of Liverpool)

Format: Regular session

Archaeologists and historians are invited to present papers that focus on a single object from the long Middle Ages (which could be, for example, a pot, a piece of metalwork, a building, or a landscape feature -- whether found in an excavation, a museum collection, or in a text) which thinks through its potential meanings as well as the interpretive challenges and uses of that object and the ways different disciplinary approaches to that object help us understand past lifeworlds. The session provides a space for historians and archaeologists to have a serious discussion about the ways our two disciplines think about material evidence, the interpretive moves we make, the problems that arise, and how, in the future, we might better combine our efforts. The goal of this session is to open a productive dialogue between historians and archaeologists as well as medievalists working across the whole of our thousand-year period.

ABSTRACTS

BEYOND A FASTENER: AN EXPLORATION OF IDENTITY THROUGH AN AMBER BEAD IN EARLY MEDIEVAL KENT

Abstract author(s): Górkiwicz Downer, Abigail (University of Chester)

Abstract format: Oral

Between 1959 and 1967, Sonia Chadwick Hawkes excavated the early medieval burial site of Finglesham, Kent, uncovering a total of 216 inhumations (Chadwick Hawkes & Grainger 2006, p. 15). Among these burials was Grave 6, dated to between the late sixth and late seventh century AD, containing an individual osteologically assessed as male, between 50 and 60 years of age. Aside from a spear, this grave contained a single amber bead at the body’s waist with an assortment of broken and intact objects.

Beads often form the mortuary repertoire of female and subadult burials and are usually considered ornaments or jewellery. In male burials, single beads are often encountered near sword hilts. Amber has also been regarded as amuletic by archaeologists, and historic sources reference women’s use of amber. However, when viewed in its context, this bead suggests that it was an element of fashion, emphasised identity, and had a role in mourning the dead. An examination of this bead with available archaeological data suggests that beads and amber cannot be reduced to simple characterisations and held various meanings in early medieval Kent.

Chadwick Hawkes, Sonia & Grainger, Guy. (2006). The Anglo-Saxon cemetery at Finglesham, Kent. Oxford: Oxford University School of Archaeology.”

2

AN ETERNAL TREASURE: AN EXPLORATION OF AMBER’S CONCEPTUAL VERSATILITY IN EARLY MEDIEVAL ALSACE, KENT, AND EAST ANGLIA

**Abstract author(s):** Górkiewicz Downer, Abigail (University of Chester)

**Abstract format:** Oral

When encountered in early medieval burial assemblages, amber artefacts are usually regarded as ‘amulets.’ Such finds are frequently discovered in burials both in Britain and Western Europe extending from the fifth to the seventh centuries AD. As with other objects, such as cowrie shells belonging to the genus *Cypraea*, the interpretation of amber as amuletic and magical denies amber’s various contextual positions and uses in burial practices and emphasises only some of amber’s uses in both contemporary and anachronistic historical living contexts.

This paper aims to demonstrate the efficacy of a methodology developed as part of my doctoral research inspired by previous spatial approaches and relational theories. By highlighting the positioning and physical associations of amber objects in graves from different burial sites throughout Alsace, Kent, and East Anglia, I demonstrate that amber retained diverse meanings in the Early Middle Ages and possessed multiple roles and identities in mortuary ritual.

3

FRAGMENTS OF A VALKYRIE: A RECONSTRUCTED AMULET FROM VIKING AGE RIBE

**Abstract author(s):** Deckers, Pieterjan - Croix, Sarah - Sindbæk, Søren (Centre for Urban Network Evolutions - UrbNet, Aarhus University)

**Abstract format:** Oral

The recent excavation on the Viking Age trading site of Ribe, conducted as part of the Northern Emporium project, yielded thousands of artefacts within a high-definition chronostratigraphic framework. Amongst these finds, few capture the imagination like a number of casting mould fragments bearing impressions of a female figure, helmeted and armed with shield and sword: an image usually identified as a valkyrie. These fragments were found in a workshop context dateable to the first half of the 9th century.

In this presentation, we challenge the current interpretive paradigm that approaches material evidence for Viking religion and magic in a singularizing and retrospective fashion, relying heavily on written evidence that is often centuries younger. Guided by a virtual 3D reconstruction of the image, we develop a ‘period eye’ and place the Ribe valkyrie in its multiple contemporary contexts: as a type of pendant found across the Viking world; as an innovative piece of iconography; as one of a range of dress accessories and amulets produced by an urban craftsman; and as a meaningful actant in religious belief and practice.

Through this lens, we suggest that the Ribe valkyrie sheds light on societal and religious transitions during the early Viking Age, the impact of urban craft production, and the ways in which women helped shape Viking culture.

4

WEST STOW SFB 16: A WINDOW ON EARLY ANGLO-SAXON ANIMAL HUSBANDRY, SETTLEMENT, AND SOCIETY

**Abstract author(s):** Crabtree, Pam (New York University)

**Abstract format:** Oral

The Early Anglo-Saxon settlement of West Stow, Suffolk, UK was excavated by Dr. Stanley West between 1965 and 1972, at a time when archaeological science was just coming of age. Excavations at the site revealed 7 small timber halls surrounded by 69 sunken-featured buildings or *grubenhäuser*. In addition to providing a model for Early Anglo-Saxon settlement, the site also yielded an extensive faunal collection of approximately 175,000 animal bones and fragments. This paper will focus specifically on SFB 16 in order to address specific questions of Early Anglo-Saxon animal husbandry, settlement, and society.

West Stow SFB 16 is a 2-post sunken-featured building with sloping pit walls. This SFB was chosen because its fill yielded two complete dog skeletons. These two skeletons can inform us about early Saxon attitudes toward dogs, while the fill of the pit itself can provide broader data on Early Anglo-Saxon animal husbandry practices. The SFB and its location within the site can also shed light on Early Anglo-Saxon settlement practices. In particular, I want to address the question of just how Anglo-Saxon these sunken-featured buildings really are.

5

MAGIC CHARMS OF EVERYDAY LIFE – OBJECT BIOGRAPHY OF A SMALL FIND

**Abstract author(s):** Nordström, Annika (Dept of Archaeology and Ancient history, Uppsala University)

**Abstract format:** Oral

What can a lead cross engraved with runic inscriptions of the kabbalistic acronym *Agla gala laga gala laga* – *Deus meus* – *agla gala laga agla*, tell us about medieval life in a small town by the Baltic Sea in Sweden? The context in which an artefact is found is of crucial value for how to interpret both the item and the context itself. But what about the artefacts found in secondary and third contexts? This paper deals with a small lead cross found at an excavation in central Nyköping in Sweden. The cross was found in a secondary filling (dated to the early 14th century) underneath the towns’ council square, which means that the context was not optimal. By using a biographical approach in combination with runology and historical sources the interpretative value of the artefact is enhanced and may shed light on different aspects of medieval town life in the European periphery.

6

THE STORY OF A SEAL MATRIX

**Abstract author(s):** Jancar, Mojca (Institute for the Protection of Cultural Heritage of Slovenia, Centre for Preventive Archaeology) - Ravnik, Mateja (Institute for the Protection of Cultural Heritage of Slovenia, RO Celje)

**Abstract format:** Oral

During excavations of Upper Maribor castle in 2010 on Piramida hill above Maribor, Slovenia, a broken metal seal matrix was discovered in the castle courtyard and in the following year, a ceramic object with imprints of that same seal matrix was found in a waste pit nearby.

This is going to be the story of this seal matrix from the moment of its discovery to historical attribution, finding its owner in Ulrich II. of Maribor (a ministerialis who administered the castle sometime between 1229 and 1252) and gathering knowledge about Ulrich’s family – the ministeriales of Maribor. The mysterious ceramic object with imprints of this seal matrix will also play the part in this story.

But the story would not be complete without challenges and mishaps the authors met when they tried to unravel the history of this small object in the archives of two countries and navigate their way between very different and often contradictory views of historians.

7

HOW A CHILD’S TOY CAN INDICATE THE PROFESSION OF PARENTS

**Abstract author(s):** Glazunova, Olga (Institute of Archaeology Russian Academy of Sciences)

**Abstract format:** Oral

Finds of clay toys are one of the main sources of our knowledge about children’s games of the middle ages. However, it is not always clear is this a toy, or an amulet or other ritual thing.

Among the Russian zoomorphic clay toys of the medieval period, there are no images of wild animals, except for the bear. The bear figures, however, was always depicted in a muzzle, that means, what it was a tame bear, a participant in the performances of buffoons. Most bear images are very realistic. It is pictured standing on four paws, as befits an animal. However, there is an exception. During the excavation of the Zachatievsky monastery in Moscow, was found a clay figure of a bear, or rather a bear cub, that looked like a Teddy bear. This toy has another interesting feature. It was made very clumsily. When you are looking at it, you immediately imagine figures sculpted by small children from modeling clay. It had uneven torso, sloping head, limbs of different sizes. The eyes are made in the form of indentations made by a small child’s finger. Apparently, the toy was really sculpted from clay by a child. But then it fell into the hands of an adult, who carefully covered it with an angob and sent it to the kiln. In addition to the bear cub, several items of little doll’s ware were found in the same place, which were made very skillfully and exactly repeating the big ones used in everyday life. These were typical for Moscow of the XV-XVI centuries products made of red clay “polka dots”, covered with spots of white angoba. The find suggests that the little bear’s owner was a girl and the daughter of a Potter.

8

“WHEN THE LOOP IS BROKEN” - A SECONDARY HOLE IN THE MEDALLION FROM GNIEW (POLAND) AS AN EXAMPLE OF RECYCLING

**Abstract author(s):** Michalik, Jakub (Nicolaus Copernicus University in Torun)

**Abstract format:** Oral

The subject of the paper is a medallion with the image of St. Joseph Calasanz and the Piarist shield. The medallion comes from the archaeological research in the church in Gniew (Poland) which took place in 2012. The medallion was found in the burial located in the church’s nave.

The medallions are part of „devotional items” group alongside crosses, scapulars, prayer lines, saint’s pictures and others. Mainly they are associated with Christian religion, so they can determine if the burial is Catholic or Protestant, especially when the church has been passed from one hand to another over the years.

Features such as visible signs of repairs makes the medallion interesting and therefore we can assume it could have more functions; They could be used not only for prayer purposes.

The following work is an attempt to look at a specific form of medallions - secondary piercing - as a kind of old recycling, which meant that despite mechanical damage it could still be worn and fulfill its functions, both sentimental and prayer.

9

EPHEMERAL MATERIALITY: THE MEDIEVAL WOODEN BOWL OF HOYO DE LOS HERREROS CAVE (CANTABRIA, SPAIN)

**Abstract author(s):** Martin Seijo, Maria (Universidade de Santiago de Compostela)

**Abstract format:** Oral

During the medieval period plants supported and enabled almost every activity and, also provided essential raw materials for crafting such as wood. At the cave of Hoyo de los Herreros (Reocín, Cantabria, Spain) a group of three wooden bowls were recovered. One of them, that was dated to the 11th-12th centuries AD, has been selected as an example of the ephemeral materiality of the medieval period. Wooden recipients were of widespread use for preparing and consuming food and drink during this period. This object will allow us to reflect about the perishable material culture that made part of the day-to-day life of the medieval communities.

Besides, the occurrence of the wooden bowl in a cave context will be put in relation to the growing number of cave occupations attested during the Middle Ages, and it will be compared to other examples of wooden containers recovered from other sites of similar chronology in the northern area of Iberia.

10 SILK POUCH FROM A CULTURAL LAYER OF MEDIEVAL MOSCOW

**Abstract author(s):** Elkina, Irina (Institute of Archaeology Russian Academy of Sciences)

**Abstract format:** Oral

In 2015, archaeological excavations were carried out in the center of Moscow on the territory of Zaryadye. During the excavation, a street fragment was uncovered that was in use from the 13th to the middle of the 20th century. A cultural layer with a thickness of more than 5 m has accumulated in this place. In the cultural layer, along with finds dating from the late 14th century, a small, heavily soiled textile object was found that lost its original shape and color. After the restoration, it turned out to be a small silk pouch. The pouch has a rectangular shape and dimensions of 7.5 × 8.5 cm and was sewn from patterned silk fabric. There are holes along the top edge. A string could be pulled through them, with which the pouch could be closed. Such a textile object is found for the first time in Russia. A search for analogies revealed that similar objects were widespread in medieval Western Europe. They were called “omoniere” (from the French Aumonière) and represented a small pouch in which money, valuable objects as well as religious relics were kept. They were sewn from expensive fabrics, sometimes decorated with tassels and embroidery. The object found in Zaryadye is similar in shape and design to some items that are exhibited in museums in Germany, Austria and France. Given the small size, the object found can serve as a wallet or reliquary. Was it owned by a rich Russian or a foreigner? How did it appear on the street? Was it lost by a passing citizen or a passing traveler? Why was it empty? Perhaps the pouch was first stolen from the owner and then thrown away by the thief after its contents were removed? These questions remain open.

11 THE IRONMONGERS’ PALL: HEARSE CLOTHS, POSTMORTEM IDENTITY, AND THE REFORMATION IN ENGLAND, 1400-1600

**Abstract author(s):** Donovan, Bethany (University of Michigan)

**Abstract format:** Oral

In 1515, John Gyva donated a richly decorated hearse cloth to the Ironmongers’ Company of London. This object embodies the complex ways in which both the living and the dead attempted to express their identity through material culture in late medieval England. Textiles were an essential part of the material world of late medieval London, decorating bodies and interiors as well as caskets and corpses, yet they survive only rarely in archaeological contexts. Textual sources, particularly those generated as part of the religious reforms of the sixteenth century, offer an additional and complementary lens through which to access them, adding to our understanding of the way individuals negotiated periods of change and constructed their social identities through material culture. On the part of the donor and his wife, this cloth was a display of wealth and status, while simultaneously serving as a testament to their piety and a plea for their souls, ensuring they would not be forgotten or linger too long in purgatory. In later funerals, the cloth allowed members to affirm their connection to the Company and their place within in a community, comprised of both the living and the dead. This object is further emblematic of surprising continuity in the face of substantial change. The nature of surviving evidence makes it difficult to track individual items like this through their use-lives, but by combining textual evidence concerning multiple objects of this type, this paper demonstrates that objects like it continued to be used throughout the sixteenth century. Thus, contrary to what scholars have previously suggested, hearse cloths remained a prominent feature of funerals, even as religious practices changed around them. This persistence troubles established chronologies and raises questions about the impact of the Reformation on different aspects of material culture.

a. ART AND DUST - NEW INTERPRETATIONS OF A GROUP OF LSTOVE TILES FROM LATE MEDIEVAL HUNGARY

**Abstract author(s):** Rakonczy, Rita (Eötvös Loránd University, Institute of Archaeological Sciences)

**Abstract format:** Poster

The research of the Hungarian stove tiles was fundamentally grounded by two finds that were discovered in Banská Bystrica at the turn of the 19th-20th century. Among the finds from the houses of Bothár and Ěbner high-class stove tiles decorated with figurative scenes could be seen, which looked alike the winged altars from the 14th-15th century. Due to the spoiled and semi-finished pieces of Banská Bystrica, the ensemble was identified as a workshop. Later similar stove tiles were found all over Northern-Hungary, which were initially considered to be products of the workshop in Banská Bystrica. During the past years, the study raised the possibility of the existence of several workshops, where similarly styled stoves stiles were produced. Nevertheless, no effort was made to identify these workshops or workshop areas.

At the Castle Čábrad’ (Slovakia) in 2015-2016 similar stove tiles were found decorated with figurative scenes, which are somewhat different from the “original ones” found in Banská Bystrica. The primary focus of this research is not on the parallels between the depicted scenes – as in the previous studies –, but on other production factors such as clay, glaze, back-side. The most important task is to separate the actual stove tiles from the different models, which were in use. This method can probably help to identify the origin-workshops or workshop areas of the so-called Banská Bystrica type stove tiles.

b. GRAVE 104 AT ANGLO-SAXON BERINSFIELD AND HETERONORMATIVE ERASURE OF THE UNUSUAL

**Abstract author(s):** Ki, Sabrina (Durham University; University of Exeter) - Gowland, Rebecca (Durham University)

**Abstract format:** Poster

This poster focuses on the individual buried in Grave 104 (G104) at Berinsfield, an early Anglo-Saxon cemetery. G104 is highly unusual: skeletally, they were probably male and buried with ‘female’ grave-goods and several ‘neutral’ objects, and was the only grave in Berinsfield containing charred logs with the body. The interpretation of G104 as ‘material evidence’ takes one form in the osteological laboratory, and quite another in the ‘Discussion’ chapter of the site report. G104’s recorded sex was swapped from male to female, overriding supposedly unreliable osteological sexing, and assigned female based on grave-goods. There was also no mention of the wood-burning nor any interpretations of it in the discussion of G104. Despite G104’s potential to illuminate understanding of Anglo-Saxon gender and identity concepts, this avenue of analysis was, disappointingly, left untaken.

G104 is highly intriguing through its multi-faceted capacities of meaning and interpretation, which were erased in the ‘Discussion’ chapter. G104 asks how we should infer past lifeworlds, social practices and identities from the remains of individuals of past and future discoveries. Who decides if osteological profiling takes precedence over ‘traditional’ gendering via grave-goods, and vice versa? And the importance of contextualizing historical information must not be neglected, such as Anglo-Saxon and Old English literature and laws. Rather than seeking to fold unusual cases into the dominant paradigm, we as researchers must be open to diverse explanations and interpretations that do not require the individual to be normalised according to modern Western ideals of gender and identity. Multiple lines of evidence can provide a more holistic interpretation of the past – no social or biological identity ‘trait’ exists in a vacuum. Cross-disciplinary discussions between historians and archaeologists, especially with fascinatingly tricky interpretations of people such as G104, would help create new research possibilities and improve understandings of past lifeworlds.

163 BETWEEN TIME, BETWEEN METHODS: EXPLORING THE LINKS OF CHALCOLITHIC AND BRONZE AGE CARPATHIAN BASIN THROUGH A CERAMIC LENS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Staniuk, Robert (Kiel University, Institute of Pre- and Protohistoric Archaeology) - Lie, Marian (Romanian Academy, Iași Institute of Archaeology) - Oravkinová, Dominika (Slovenská Akadémia Vied, Archeologický ústav)

**Format:** Regular session

From delimitation of interaction areas to consideration of technological changes, the prehistoric ceramics of the Carpathian Basin and the adjacent areas provide new fields for integrating theory with high-resolution studies of the human past. Beyond re-evaluation of the relative dating, the technological advances of the Information Age highlight the necessity of re-thinking the research questions: does conjunction of production and interaction represent the only facet of ceramic style formation? What underlying histories are responsible for the formation of the archaeologically-distinctive groups? How can overarching similarities of the technological process be used to explain the maintenance of obvious distinctions?

Expansion of the scope beyond material characterizations towards the socio-cultural processes is further mobilized by the increasing availability of analytical methods where ceramics are no longer viewed from the perspective of typochronological studies but provide the medium for investigating subsistence practices, site-formation processes and exploitation of the natural environments. The involved framework of archaeological practice integrating perspectives and methods results in an increasing complexity of research and the developed models of human past. The refined analytical tools provide the means of investigating previously inaccessible parts of the prehistoric record and conceptualization of turning points between otherwise separated periods.

The transition from the Chalcolithic to the Bronze Age represents a time of change in terms of formation of individualized personhoods and the increasing examples of collective habitation. How can the two be linked to formation of Bronze Age tell-landscape? Beyond typological similarities and temporal consecutiveness, is there other evidence of relationship between periods and regions? Finally, how did the introduction of bronze technology impact the existing economic relations and established technologies?

As organizers we invite papers, work-in-progress studies and posters which explore the multidisciplinary approaches to the highlighted period by integrating social theory, ceramic analysis and the dynamics of the human past.

ABSTRACTS

1 THE ROLE OF CARPATHIAN CHALCOLITHIC HERITAGE IN THE DEVELOPMENT OF THE EARLY BRONZE AGE CERAMIC STYLES

**Abstract author(s):** Ciugudean, Horia (Muzeul National al Unirii Alba Iulia)

**Abstract format:** Oral

The Early Bronze Age discoveries recently made in the south-west and central areas of Transylvania (Romania) have offered new evidence regarding the participation of Late Chalcolithic heritage in the development of the first Early Bronze Age ceramic styles. The analysis of the Livezile ceramics (c. 2800-2500 BC) found both in the settlements and in the tumulus burials excavated in the Apuseni Mountains clearly shows important links with the previous Coțofeni culture (c. 3500–2800 BC), closely related to the Baden complex. The deposition of Coțofeni pottery in the earlier Yamnaya pit-graves of southern Romania and northern Bulgaria is followed



by the presence of Livezile pottery within the Yamnaya graves of the Tisza region in eastern Hungary. Early Bronze Age ceramic vessels of Carpathian provenance have been found in Yamnaya contexts even further to the East, which demonstrates the networking between the Balkan-Carpathian and Yamnaya societies in the first half of the 3rd millennium BC.

## 2 THE BEGINNING OF MIDDLE BRONZE AGE IN SOUTHEASTERN TRANSYLVANIA

**Abstract author(s):** Puskás, József (National Museum of Eastern Carpathians)

**Abstract format:** Oral

The Southeastern part of Transylvania was a contact zone from the very beginning of human history. Here influences from the Carpathian Basin and the Eurasian steppe meet, resulting a particular material culture. A similar case can be traced during the Middle Bronze Age (MBA), when contacts between the Transylvanian Wietenberg culture and the Moldavian Monteoru culture emerged. These contacts are best represented on the appearance and evolution of the pottery. The present state of research is that at the very beginning of MBA in the Southeastern part of Transylvania the Costișa/Ciomortan culture (located north of the Monteoru culture, still in Moldavia) infiltrated, resulting a later appearance of the Wietenberg communities. This Costișa/Ciomortan “domination” is based on two settlements, known until now in Transylvania and a few ceramic fragments discovered on some Wietenberg sites. Research of the last decade shed light on a different situation. A lot of Monteoru ceramics were identified in museum deposition, much more than previously thought and published. Also recent field surveys identified new spots with this ceramic type (truly most of them on Wietenberg settlements) and recently a “pure” Monteoru settlement was discovered. Some early Wietenberg cremation urns bear Monteoru-like decoration, very likely as a result of close contacts. Recently new radiocarbon dating were made on cremation remains which, compared with other results, hopefully will soon bring the question to an end.

## 3 TRANSITION IN MOTION. EXPLORING THE LINKS BETWEEN CHALCOLITHIC AND BRONZE AGE IN THE MIDDLE DANUBE VALLEY

**Abstract author(s):** Staniuk, Robert (CRC 1266 “Scales of Transformation” Christian-Albrechts-Universität zu Kiel)

**Abstract format:** Oral

The formation of Middle Bronze Age (2000-1600 BC) tell communities in the Middle Danube Valley represents a consequence of a long-term process of population agglomeration. This process had a profound impact on the formation of interaction networks resulting in the development of different pottery styles and the spread of technology, e.g. bronze metallurgy. From an archaeological perspective, the understanding of the change taking place in the second millennium BC relies on the information acquired from the investigation of tell sites. Primarily tells are an outcome of the abundance of stratigraphy and material culture, and the consolidation of this specific form of habitation represents a transformation of the Chalcolithic spatial management, social organization and organization of production. While the links between the Chalcolithic, Early and Middle Bronze Age are usually formulated on the basis of ceramic typochronology, geographic proximity, and sequences of cultural groups, understanding the trajectory of change is often hindered by the divergent forms of occupation and material culture differences.

The paper will discuss the results of the combined stratigraphic and material culture investigation from the Early and Middle Bronze Age settlement in Kakucs-Turján as means of identifying qualitative differences occurring in the first half of the second millennium BC. The observations will serve as the potential field for the comparison of cultural change taking place at a larger scale in the third millennium BC in the Middle Danube Valley.

## 4 INSIGHTS INTO POTTERY TECHNOLOGY AT THE EARLY BRONZE AGE FORTIFIED SETTLEMENT IN SPIŠSKÝ ŠTVRTOK

**Abstract author(s):** Oravkinová, Dominika (Institute of Archaeology of the Slovak Academy of Sciences) - Petřík, Ján (Department of Geological Sciences, Faculty of Science, Masaryk University)

**Abstract format:** Oral

The pottery of Otomani-Füzesabony Cultural Complex represents, among the diverse range of ceramic styles that occur in the Carpathian area across the Chalcolithic and Bronze Age, a singular element. Due to the technological complexity of the manufacturing accompanied by often over-exposed decorative compositions, it is properly being considered for „ceramic baroque“ of the East-Central European Bronze Age. However, it is intriguing to uncover what else could be hidden behind an attractive visual? What can be revealed about the craft, craftsman, and consumers?

The operational sequence and production traits of the fineware and coarseware pottery can be relevantly traced at the intra-site level through the assemblage from the fortified settlement in Spišský Štvrtok. While micropetrographic and chemical analyses of the main fabric groups assume different traditions in processing of the raw materials and recipes preparation, the macro traces observed on the final products testify to the forming methods and techniques. Results indicate, that some of the certain shapes could be produced using a specific technology, while the others were rather produced across to various traditions. These, in correlation with the use-wear traces, allow to read their biographies and craft adaptation in the former living culture. Finally, it contributes to the clarification of the potentially (un)significant relations of the technological and morpho-typological groups of vessels across individual households. The summary of the results offers a fresh overview of the pottery collection, which was produced and utilised by a particular social unit at the turn of the Early and Middle Bronze Age on the northeastern frontier of the Carpathian Basin.

## 5 POTTERY COMPARISONS BETWEEN TWO CONTEMPORARY HORIZONS OF NEIGHBORING BRONZE AGE TELL-SETTLEMENTS (SÂNTION AND TOBOLIU)

**Abstract author(s):** Gogaltan, Florin (Institutul de Arheologie si Istoria Artei Cluj Napoca; Universitatea de Vest din Timisoara) - Lie, Marian (Institutul de Arheologie Iasi) - Fazecas, Gruia (Muzeul Tarii Crisurilor Oradea)

**Abstract format:** Oral

One of the objectives in our project Living in the Bronze Age Tell Settlements: A Study of Settlement Archaeology at the Eastern Frontier of the Carpathian Basin financed by the Romanian Ministry of National Education between 2013 and 2016 was that of checking two neighboring and contemporary tell sites. For this purpose we have chosen to excavate the sites from Sântion Dealul Mănăstirii and Toboliu Dâmbu Zănăcanului that are located approximately 7km from each other .

The C14 samples collected from the uppermost Bronze Age layers at Sântion yielded a result comparable with the one from the lowermost levels at Toboliu, thus showing a possible synchronicity between the two dated archaeological horizons. Although the site from Sântion started to be inhabited earlier than the one from Toboliu, both of them follow a similar pattern of Bronze Age tell-site formation (multilayered settlements with several phases of construction -destruction-reconstruction of surface houses built in the wattle and daub technique into a confined space). Nevertheless, considering the chronological differences, several unique characteristics were also identified for each site.

Within the following presentation we will try to establish some links between the pottery that was found within the above mentioned contemporary horizons, highlighting the comparable features which point towards potential cultural or technological similarities or/and differences. This endeavor will contribute to the broader image of ceramic production at the beginning of the Middle Bronze Age (approx. 1900-1700 BC) within a micro region on the eastern frontier of the Otomani-Füzesabony cultural complex.

## 6 TRADITION AND INNOVATION. THE LATE BRONZE AGE POTTERY IN THE LOWER MUREȘ BASIN

**Abstract author(s):** Sava, Victor (Museum of Arad)

**Abstract format:** Oral

Various chronological systems have been developed over time and their accuracy has increased as absolute dates became more frequently employed. Our current capacity to correlate chronologically artifacts, contexts, and cultural phenomena is strongly influenced by the existence and number of available AMS dates. In order to answer pressing needs, I shall put forward the elaboration of a chronological system of the Late Bronze Age in the Lower Mureș Basin, a key micro-region of the intra-Carpathian area. As phenomenological benchmarks of this geographic area one should mention the development of Middle Bronze Age tells. They stopped being inhabited during the 16th century, a phenomenon followed in the beginning of the Late Bronze by the construction of mega-forts that enclosed tens, hundreds, and thousands of hectares.

The lack of a reliable chronology has created and still creates numerous confusions among those who research these archaeological realities. In order to surpass this draw-back, but also in order to provide some explanations for the profound changes of Bronze Age society I have elaborated a chronological system based on the association of absolute dates, the contexts from which they were sampled, and the associated artifacts. 39 AMS dates are available so far from the Lower Mureș Basin. They have been sampled from 38 contexts in seven sites: four settlements, two cemeteries, and a fortification. These dates cover the time span between the 16th century BC and the first half of the 13th century BC, corresponding more accurately to the abandonment of the tells, the construction of the mega-forts and their subsequent destruction. In order to test several hypotheses related to the continuity and discontinuity of pottery styles in the analyzed area I shall follow the chronological span, the spatial distribution, and the intensity of pottery shapes, decoration techniques, and decorative motifs.

## 7 DACTILOSCOPY AND ARCHAEOLOGY-METHODOLOGICAL APPROACH ON CUCUTENI CULTURE FINGERPRINTS

**Abstract author(s):** Kovacs, Adela (Botosani County Museum)

**Abstract format:** Oral

One of the main forensic methods of identifying people is dactiloscopia, which is based on analyzing the features of the papillary relief. Papillary relief is made up of ridges and grooves that form papillary drawings whose appearance is formed during the intrauterine period of the foetus. The sustainability of the use of this method is given by the uniqueness and stability of the drawings of the papillary relief, which resists in several characteristics regarding the placement, their shape and size. The characteristics exclude the repeatability of a certain papillary type and elements of the papillary relief drawings are stable over time. Papillary traces are created as a result of direct contact between the papillary relief and a support. When the support is smooth and relatively hard, the papillary traces are surface and can be created by stratification / de-stratification depending on the transfer process of the substance that reproduces the papillary pattern. When the support is plastic the papillary relief is reproduced in depth and the papillary traces created in this way can be preserved for a long time. The investigation of objects for the detection of papillary traces is made in criminalistics using light sources with variable wavelengths or with the possibility of changing the angle of incidence. The prehistoric prints are found on a number of materials, but ceramics are the most common. The primary condition for the preservation and discovery of ancient fingerprints is a close collaboration between archaeologists and conservators. A careful approach to cleaning and restoring artifacts as well as an awareness of the existence of fingerprints can greatly help in the identification process. The

presentation is showing the method for prevailing fingerprints and the results after analyzing several ceramic shards with such traces from a Cucuteni A3 archaeological site.

8 HIGH RESOLUTION IMAGE ANALYSIS OF POTTERY THICK SECTIONS

**Abstract author(s):** Lie, Marian (Iasi Institute of Archaeology) - Găvan, Alexandra (University of Cologne)

**Abstract format:** Oral

The following presentation is proposing a methodological approach towards obtaining and analysing ceramic thick sections. These can reveal details regarding the quality of firing, kneading, temper and inclusions, all important aspects in quantifying and interpreting technological developments of pottery. The samples used in this analysis were prepared from ceramic fragments found within the Middle Bronze Age tell settlement of Toboliu Dâmbu Zănăcanului (Bihor County, Romania). The site offers an ideal case study for this approach, as it has a continuous habitation that spans for over 350 years, from approximately 1900 to 1550 BC with 7 phases and abundant ceramic discoveries.

The microscopically analysis of pottery sections has long been used within ceramic studies. However when dealing with large batches, such as those from multilayered sites, this approach can be time consuming. The method proposed here is addressing this issue by employing a software script that is able to automatically identify specific features. Compared to the classical approach, this method is based on high resolution images of the microscopically magnified sections, which also allows for a wider analysed surface.

9 INTERDISCIPLINARY TECHNIQUES INVOLVED IN THE STUDY OF MIDDLE BRONZE AGE POTTERY FROM SILIȘTEA-PE CETĂȚUIE, ROMANIA

**Abstract author(s):** Drob, Ana („Alexandru Ioan Cuza” University of Iași) - Vasilache, Viorica („Alexandru Ioan Cuza” University of Iași) - Bolohan, Neculai („Alexandru Ioan Cuza” University of Iași)

**Abstract format:** Oral

This study illustrates a model of interdisciplinary ceramic analysis that provides a series of information about prehistoric pottery. The methods used in the analysis rely on macroscopic examination (form, color, wall thickness, firing type, inclusions, their distribution, form and sorting), optical microscopy (texture of the matrix, surfaces and inclusions details), SEM-EDX (elemental composition) and  $\mu$ FT-IR (chemical compounds). The analyzed pottery fragments are dated to the Middle Bronze Age (Romanian-Hungarian chronology) and were recovered from the settlement of Siliștea-Pe Cetățuie. The finds represent Costișa and Monteoru cultures which covered a relatively small, well-defined area in the Eastern Carpathian Basin (Moldavian Subcarpathians – Cracău-Bistrița Depression). The fact that these two cultures are contemporary and even cohabited some settlements is reflected in their pottery. Thus, the interdisciplinary methods are used in order to obtain more information about the nature of the raw materials and production technology, inclusions, combustion temperature and possible uses of vessels. Finally, it is intended to identify as much as possible through archaeometric studies of the cultural characteristics of the pottery associated with these two communities.

a. SO SIMILAR AND YET DIFFERENT? CERAMICS AND PEOPLE IN LATE/FINAL ENEOLITHIC IN WESTERN SLOVAKIA

**Abstract author(s):** Mellnerova Sutekova, Jana (Department of Archaeology, Faculty of Arts, Comenius University in Bratislava)

**Abstract format:** Poster

The Late and Final Eneolithic in Western Carpathians (3rd Millenium calBC) is in the traditional approach characterized by the change of archaeological cultures, which from Post-Baden time gradually acquires Early Bronze Age elements. The archaeological picture based on material culture is still not clear. In detail, we recognize an amalgam of pottery styles defined mostly by fine ceramic (Bošáca, Jevišovice, Kostolac, Makó-Kosihy-Čaka etc.) spread in lowland and upland, and still have “white” regions without settlements mostly in northern mountain territories. Moreover the pottery assemblages with a small amount of „cultural datable” potsherds and with mixed inter-/multicultural elements in the rest sherds are known, e.g. horizon Strachotín-Držovice (Late E.), phase Neusiedl (Final E.). These examples with not cultural unified elements, with chronologically not homogenous components, disturb the paradigm of archaeological culture. Based on what we classify or date the features and interpret the cultural situation?

The Author looking for answers in region of westernmost part of Carpathians in western Slovakia. The research is based on ceramic typology and petrographic analyses of both ceramic groups coarse and fine ware from more features with several cultural dating (Bošáca, Jevišovice). They are defined more groups of components to look for similarities and differences in space (microregion vs. Central Danube) and chronology (from Post-Baden to Early Bronze Age). It is important to analyze pottery assemblage as a whole (incl. coarse ware) and then we could get more real picture about local people, their traditions and communication trajectories in the area of our interest.

This work is supported by grant scheme VEGA No.1/0100/19.

166 ROOTED COSMOPOLITANISM: TOWARDS A GLOCALIZATION OF HERITAGE AND HERITAGE PRACTICES?

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Versluys, Miguel John (Leiden University, Faculty of Archaeology) - Lilley, Ian (The University of Queensland)

**Format:** Regular session

Many concepts of present-day heritage discourses - such as world heritage, local heritage practices or indigenous heritage - show a tendency to ignore the complex interplay between the local and the global. However, no human group ever creates more than a part of its heritage by itself. To address this paradox this session explores the idea of Rooted Cosmopolitanism. This concept emphasises the fact that, in localities all over the world, cultural heritage is always in the process of becoming and that these local processes are inherently shaped by global connections. Rooted Cosmopolitanism emanates from local settings and practices (it is rooted) while at the same time it moves beyond the essentialism of cultural diversity (it is cosmopolitan). As such the concept might well be capable to critically reflect on the ideological dichotomy between globalization and isolation that characterizes our current political climate and strongly influences Heritage practices in nation-states worldwide.

We invite contributors to tackle these questions both from a theoretical perspective and by means of a bottom-up approach. What do we mean by that? More and more, archaeological interpretations of the past show that Globalisation is indeed a very deep historical process. All the objects, assemblages, monuments and sites we excavate, document and preserve, therefore, are inherently cosmopolitan in nature. This characteristic, however, often sits uncomfortably with the discourse and Heritage practices of nation-states in which this work takes place. We know that the solution of nation-states to this problem is forgetting, or rather selective remembering. But can the concept of Rooted Cosmopolitanism be a more productive solution to this problem, also for nation-states? We invite contributors to present their experiences concerning the exploration of a global past in local present and to explore the concept of Rooted Cosmopolitanism as a possible solution to this paradox.

ABSTRACTS

1 EFFECTIVE ASPIRATIONS? PARALLELS BETWEEN COLLABORATIVE ARCHAEOLOGY AND ROOTED COSMOPOLITANISM IN CENTRAL AMERICA

**Abstract author(s):** Geurds, Alexander (Leiden University; University of Oxford)

**Abstract format:** Oral

Latin America doesn’t matter, at least according to Richard Nixon, now almost 50 years ago. More disturbing still, such cynical observations also hold currency today, against the backdrop of 20 years of a strengthening anti-cosmopolitan surge in the West. Yet, Middle and South American postcolonial histories are some of the longest in a world history perspective, featuring many contexts in which local knowledge is in a strained relationship with national concerns and global entanglements. In this context, archaeological work in Latin America now increasingly features the emergence of decolonizing, collaborative research practices.

How do such long trajectories of indigenous identity, nation-state imaginaries, and globalizing connectivity, result in a sustainable future for the idea of archaeological heritage? While cosmopolitanism is a notoriously multi-faceted concept, holding a genealogy in Classical Western philosophical traditions, rooted cosmopolitanism is understood in this paper as a normative idea that complies with four conditions for a sustainable and critical engagement with local heritage. First, to highlight locally contextualized senses of heritage, rather than national or supranational forms. Second, rooted cosmopolitanism works through progressive dialectical reflexivity, rather than through cultural adoption or borrowing. Third, in critically focusing on social change, rooted cosmopolitanism can affect positive change. Fourth, it strives to free cultural diversity from domination.

Through collaborative archaeological work in Nicaragua, this paper illustrates the contradictions encountered in the social realities within this Latin American nation state, showing that archaeology increasingly shows similarities with the philosophical backdrop to rooted cosmopolitanism. Central to such work, powerfully summarized by Anne Stahl as “effective archaeology”, is a field methodology based around the transformative potential of dialogue, deliberation and cocreation, contra to state practices that equate heritage with regulation.

2 THE PHANTOM MAUSOLEUM: CLASSICAL HERITAGE BETWEEN LOCAL AND GLOBAL PASTS IN BODRUM, TURKEY

**Abstract author(s):** Kristensen, Troels Myrup - Nørskov, Vinnie (Aarhus University) - Bozoglu, Gönül (Newcastle University)

**Abstract format:** Oral

The Mausoleum of Halikarnassos (modern Bodrum, Turkey), dating to the mid-fourth-century BC, is one of the seven wonders of the ancient world and thus part of a very particular brand of “global” heritage. Its “global” significance has indeed been repeatedly emphasised in archaeological narratives, beginning with Charles Newton’s identification of the Mausoleum in the 19th century to more recent Danish excavations of the Mausoleum terrace (1966-77). However, in its currently ruinous state, the Mausoleum is also a deeply paradoxical monument that elicits mixed responses among the local population. To some, it is a source of pride as a monument to ancient Karian civilisation and a symbol of the cosmopolitan roots of life in the contemporary Aegean (and Republican



Turkey more broadly). To others, it represents the failure of archaeology to provide the present with a proper sense of a monumental and glorious past. The Mausoleum is a useful case study for understanding the complex development of Turkish cultural heritage politics over the course of the last century, as seen from the perspective of a small town on the Aegean that, during the second half of the twentieth century, has been drastically transformed by the effects of mass tourism and urbanisation. This paper digs deeper into the tensions between “global” and “local” pasts, based on ethnographic fieldwork undertaken by the authors in Bodrum, as part of the CoHERE (“Critical Heritages: Performing and Representing Identities in Europe”) project.

**AKSUM ACROSS THE GLOBE: THE COMPLEXITIES OF ANCIENT EXCHANGE ROUTES AND TRANSREGIONAL HERITAGE TODAY**

**Abstract author(s):** van Aerde, Marike - Botan, Samatar (Leiden University)

**Abstract format:** Oral

The complex interplay between the local and the global was nowhere more evident than in the routes of exchange that constituted the ancient Silk Roads and Indian Ocean networks, flourishing from 300 BCE-700 CE. This paper explores 1) the complexities of these routes and their simultaneous local-global nature as evident from their archaeological remains; 2) the challenges of managing/ accessing such transregional archaeological heritage nowadays. The archaeology of these networks, particularly, remain scattered across the globe today, often defying the legislation/confined interpretations of modern-day, nation-state perspectives.

We approach these wider issues through the case-study of Aksum: the African empire that played an integral role in the exchange processes of the ancient trade networks that connected East-Africa and Eurasia. While neglected in historical reviews in the past, recent finds increasingly show that the Aksumite Empire was an influential and crucially situated African center (current-day Ethiopia and Eritrea). Its main port of Adulis, especially, functioned as cosmopolitan crossroad between the Red Sea, the Arabian Peninsula, and the Indian Subcontinent. As a result, we now find Aksumite pottery, coins, and inscriptions nearly everywhere across the regions of these ancient trade routes: from Egypt to Soqatra, Oman, Gujarat (India), and even in the ancient ports of Sri Lanka (Anuradhapura).

So far, these have predominantly been studied per site or region, while a transregional understanding of their spread and impact does not yet exist. This paper reports on the first steps we have taken to achieve this. In doing so, we have frequently encountered obstacles pertaining to the current-day management of this scattered Aksumite archaeological heritage, which starts with the problematic colonial excavation history of Aksum’s sites and materials in the early 20th centuries. The second part of this paper will focus on the resulting current issues of heritage management as integral component of our research.

**GLOCALISATION VIA CULTURE: CREATIVE MEDIUMS FOR A CO-PRODUCED HERITAGE BASED TEACHING**

**Abstract author(s):** Trimmis, Konstantinos (University of Bristol) - Fernée, Christianne (University of Bristol)

**Abstract format:** Oral

Heritage applications in educational context is a well-established way for educational practitioners to engage learners with various subjects. Particularly in humanities and arts a nation’s cultural heritage assets and its international counterparts are heavily been mobilised both as classroom engagement and topic presentation tools, when occasionally as even the main teaching medium – see for example the wide use of London’s “double decker bus” as medium for teaching transportation vocabulary in English. In this context though, the heritage assets have been produced by heritage experts and educational practitioners, and they do not reflect all the times the ideas about heritage ownership and interpretation that a modern multicultural classroom may have, with students from different cultural backgrounds interpret heritage differently. This paper aims to present in the context of the “Town of Many” and “VIA Culture” projects the application of creative mediums for co-producing local and global heritage assets to be used for teaching with the classroom. The educator is the facilitator which leads the students through performative applications to perform the heritage that surrounds them with the aim to create the teaching material for their own lessons. Case studies for this paper is the co-production of heritage assets in Cardiff UK, and Thessaloniki Greece where drama were not just been mobilised as a teaching medium, but as a tool that forms heritage assets.

**ARCHAEOLOGY AND ARCHAEOMETRY OF GLASS, 6TH TO 13TH CENTURIES CE: POSSIBILITIES OF ARCHAEOLOGICAL AND HISTORICAL INTERPRETATION OF MAJOR CHEMICAL TYPES**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Tomková, Katerina (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Herold, Hajnalka (University of Exeter) - Siemianowska, Sylwia (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Wrocław)

**Format:** Regular session

The 6th–13th centuries is a period of fundamental political, economic and cultural changes, which also affected glass production and influenced the distribution of glass and glass artefacts. Archaeometric research increasingly brings new and detailed data for the history of glass and shows a wider range of chemical types of glass compared to prehistoric times, based on wider sources of raw materials. These include soda-lime natron and plant-ash glass, mixed alkali glass, lead glass (high-lead, soda-lead, wood-ash-lead) and wood-ash/potassium glass. The first wood-ash/potassium glass started to be produced in the Carolingian Empire at the

end of the 8th century, and this led to the growing independence of glass production in NW Europe. The questions the session would like to address include, but are not limited to: What do analysis results tell us about the spread of wood-ash/potassium glass across Europe? What role did Eastern, Central and Western Europe play in the production and use of lead glass? How do archaeometric analysis results impact upon our knowledge of production technologies and techniques? What do they reveal about interregional and long-distance contacts as shown by glass and glass artefacts? Another important topic for discussion is continuity and discontinuity in the use of chemical glass types in relation to types of glass objects.

**ABSTRACTS**

**GLASS NETWORKS: TRACING EARLY MEDIEVAL LONG-DISTANCE TRADE, C. 800-1000 CE**

**Abstract author(s):** Herold, Hajnalka (Department of Archaeology, University of Exeter)

**Abstract format:** Oral

This paper presents the ‘Glass Networks: Tracing Early Medieval Long-Distance Trade, c. 800-1000 CE’ Leverhulme-funded project. This project analyses early medieval glass beads with chemical and archaeological methods, in order to develop a novel perspective on European long-distance trade networks and interconnectedness. Early medieval raw glass production mainly took place in Mediterranean and Near Eastern centres. Each produced glass with distinct chemical compositions, which was circulated to various regions, including Europe. Small-scale raw glass production also existed in north-western Europe. While the study of glass in the Mediterranean has received considerable attention, the potential of glass circulation networks to transform our understanding of trade and communication routes in Europe has yet to be fully utilised.

A major theme in the study of early medieval Europe, and specifically in the study of early medieval long-distance trade, has been the existence and nature of connections between the Mediterranean world and north-western Europe in this period. However, neither the glass evidence, nor the role of (east-)central Europe have been considered in detail in this context. As much of the early medieval glass used in north-western Europe originated in the Mediterranean, glass represents an ideal medium for studying these connections. But, while studies of the chemical compositions of early medieval glass from the Mediterranean and north-western Europe are available, these two regions have not been linked together by data from those areas that lie in between. This project investigates glass beads, with archaeological and scientific methods, from central Europe and will combine this new data with available results on glass from the Mediterranean and north-western Europe, in order to link these territories, and trace Europe-wide distribution networks.

**RESILIENCE AND MUTATIONS OF THE GLASS PRODUCTION IN FRANCE BETWEEN THE 8TH AND THE 11TH CENTURY AD**

**Abstract author(s):** Pactat, Inès (CEB - IRAMAT UMR 5060 - CNRS/Université d’Orléans)

**Abstract format:** Oral

The Early Middle Ages is a key period in the history of glassmaking, when major changes took place in the production system, both in the East and the West. The phenomena can be resumed by the transition from a mineral flux (natron) to a vegetal one (plant ash or wood ash). An investigation of almost 2000 samples of glass dated from the 8th to the 11th century AD was conducted to understand the terms and the conditions of this evolution on the French territory. Face with the lake of written sources, we have engaged a complementary approach of the rare remains of glass workshops and artefacts (vessels and window glass), combining a typological, chronological and archaeometric point of view. The identification of the different raw materials used, thanks to physico-chemical analyses, was put in perspective with the evolution of the products, their shape and their decoration. The reconstruction of the chaîne opératoire revealed the resilience of the early medieval craftsmen who mobilized innovative resources to pursue their activity and to meet growing demands. So, several chemical types of glass coexisted until the 12th century AD. Before the last imports of Egyptian natron glass in the 9th century AD, the Western glassmakers had already invented new recipes, using wood ash as flux or recycling vitreous slags from the metallurgy of silver and lead. Recycling was still practised, only using antique natron glass for special productions or mixing natron glass and wood ash glass. High-lead and wood-ash-lead glass are rare in France, but their exceptional discovery is also symptomatic of this period of mutations of the glass industry.

**PRODUCTION AND CIRCULATION OF GLASS IN SICILY BETWEEN THE 6TH AND THE 13TH CENTURY: ARCHAEOLOGICAL AND ARCHAOMETRIC EVIDENCE**

**Abstract author(s):** Colangeli, Francesca (University of Rome Tor Vergata)

**Abstract format:** Oral

During the last thirty years, archaeological and historical research on medieval Sicily has highlighted the composite nature of medieval Sicilian society. However, studies on the island’s material culture have mainly concentrated on pottery. The present research focuses on glass finds from different urban and rural contexts in Sicily, investigating questions of production and circulation between the 6th and the 13th century CE. In collaboration with two ERC research programmes (Sictransit and GlassRoutes), we have conducted the first systematic study of Sicilian glass assemblages in terms of their chrono-typological and compositional characteristics. Preliminary findings reveal a chronological evolution of the repertory of glass forms as well as differences in consumption and



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### LEAD GLASS IN EARLY MEDIEVAL BOHEMIA. CONTINUITY OR DISCONTINUITY?

**Abstract author(s):** Tomková, Katerina (Institute of Archaeology of the Czech Academy of Sciences, Prague)

**Abstract format:** Oral

The presentation deals with changes in the occurrence of glass artefacts made from high-lead and potassium-lead glass in Bohemia in the period of 850–1200. The earliest ones have been registered in the horizon with the jewellery of the Great Moravian tradition. Before the year 1000 there are only beads, especially irregular seed beads and polychrome beads with eyes and crossed lines. These beads, found in graves, are made entirely of high-lead glass. They are less frequent than beads from soda lime and plant ash glass. Although no shift occurred in the geo-political orientation of Přemyslid dukes in the 11th century and no significant change in metal jewellery can be noted either, glass adornments changed markedly. Rounded and irregular shapes persisted till the 11th and 12th centuries while new types of beads appeared; however, a cultural change was reflected by the decline of beads and a higher frequency of ring adornments. This may be related to a change in the preference of glass of different chemical compositions and the decline of soda glass, both natron and plant-ash types. The adornments were produced not only from high-lead glass, but newly from lead-ash glass. In addition, window glass accompanying the development of Romanesque architecture is also documented from glass of these chemical types. We consider the finds from the 10th century to be imports. The topography of the finds shows that some high-lead glass artefacts came to Bohemia from the Carpathian Basin. In contrast, in the 11th–12th centuries, local central European glass-working can be assumed in addition to imports. Identifying the elements of continuity and discontinuity in cultural development and the materials used is important both for the establishment of models of interregional contacts within central Europe and for the description of supra-regional and global economic changes in Europe.
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### ON THE ISSUE OF MEDIEVAL HIGH-LEAD GLASS IN EASTERN EUROPE

**Abstract author(s):** Valiulina, Svetlana (Kazan Federal University)

**Abstract format:** Oral

Determining the origin of high-lead glass is currently an urgent international problem; interest of scientists in this topic and its increasing dynamics are reflected in historiographic reviews. Glass of the PbO-SiO2 type is widely distributed from the Middle Volga region to the Atlantic, from the Russian North and Scandinavia to North Africa and the Middle East.

In Eastern Europe, the largest collection of items was found in the Middle Volga region. Their attribution is based on morphological and technological data.

Examples are Islamic glass of double-layer glass with a cameo-style decor from the 10c. in Bolgar, Byzantine beads and bracelets from the 11 to the early 12 centuries, Russian beads and bracelets, of the 12-13 centuries from the cities of the Volga Bulgaria.

The most numerous are the Byzantine beads of the 11- early 12 century. It is possible that in the XI century there was a workshop of incomplete production cycle on imported glass “B” in Izmary settlement as hundreds of beads glass PbO-SiO2 found there.

In addition to the Volga region, the concentration of such beads was found in the monuments of the Russian North and in the burial grounds of the Byzantine province of southeastern Crimea. The closest analogies to these complexes were found in museum collections and publications in Preslav, in synchronous burial sites of Hungary and Slovakia, and in Poland.

The complexity of determining the origin of high-lead glass is due to the fact that it has almost the same composition everywhere. This feature is eloquently illustrated by a summary table of the chemical composition of different regions in the article by R. Robertshaw et al. Her can be supplemented with monuments of Eastern Europe.

Researchers are unanimous that lead-isotope analysis will help in solving this problem. And it should be a big international project.
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### MEDIEVAL WOOD-ASH LEAD GLASS: NEW FINDS FROM YAROSLAVL (RUSSIA)

**Abstract author(s):** Stolyarova, Ekaterina (M. V. Lomonosov Moscow State University)

**Abstract format:** Oral

Throughout history, many different compositional types of glass have been used. One of these is wood-ash lead glass. This glass is made from sand, wood ash and PbO. Oliver Mecking (2012) describe wood-ash lead glass in detail. The distribution of this glass type till recently is restricted primarily to German-speaking areas: it was mainly used for stained glass in churches — in Germany, at Cologne, Halberstadt, Augsburg, Soest, and Erfurt; and in Austria, at Wachau, Styria, Graz, Gratwein, St. Leonhard and Loeb (Brill 1999). These are stained glass dated from 12th to 15th centuries.

In 2005 and 2008 three stained glasses of the same chemical composition – wood-ash lead glass – were found during the Russian

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### EARLY MEDIEVAL LARGE GLASS BEADS FROM CENTRAL EUROPE. THE PROBLEM OF FUNCTION AND SOCIAL SIGNIFICANCE

**Abstract author(s):** Pankiewicz, Aleksandra (University of Wroclaw)

**Abstract format:** Oral

Among the glass beads found in the early medieval sites of Central Europe, attention should be paid to extremely large specimens, with a diameter of more than 15 mm, but usually 20 mm or more. Despite the fact that these are special items and found quite rarely, they are usually described in a very superficial way. In the 1970s, large glass beads from the Polish lands were the subject of separate elaboration, but their function remains unclear. These objects are interpreted as glass spindle whorls, necklace elements, individual glass knobs as well as amulets or game pieces.

The reason for the re-conception of the topic of large glass beads from Central Europe is the quantitative growth of this group of finds and new research opportunities. By analysing the chemical composition of glass, it is possible to determine the provenance of these items. A lot of data for the interpretation of their functions is also brought by detailed analysis of the context of discovery, metric analysis and comparison, e.g. to spindle whorls, and microscopic observation of signs of use on the surface of these finds.

Re-examination of this category of finds showed that large glass beads did not have one specific function and could be used in a variety of ways depending on the needs. No matter what role they played, they were special items of great value. Usually these were imports, which were an indicator of the exceptional material status of their owner.
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### HIGH-LEAD GLASS AS A GLAZE IN EARLY MEDIEVAL POLAND 11TH-13TH CENTURY.

**Abstract author(s):** Siemianowska, Sylwia (Institute of Archeology and Ethnology of the Polish Academy of Sciences) - Pankiewicz, Aleksandra (Institute of Archeology at the University of Wroclaw) - Sadowski, Krzysztof (-) - Rzeźnik, Paweł - Stoksik, Henryk (Ceramics & Glass Reconstruction and Restauration Department, The Eugeniusz Geppert Academy of Fine Arts)

**Abstract format:** Oral

The 10th-13th century was a period of fundamental political, economic and cultural changes in Poland, primarily associated with the formation of Piast statehood, and then with the location breakthrough. One of the typical glass objects discovered in this time is glass jewellery (finger rings and beads) made of high lead alkaline and non-alkaline glass. At the same time this type of glass were also used in the manufacture of pottery.

One of the most interesting phenomena in the history of ceramics in early medieval Poland is the introduction of production of glazed vessels. Glazed pottery is not very frequent in the southern regions of the Piast monarchy (Lesser Poland and Silesia), but it is constantly found in archaeological contexts from the 11th-14th centuries. Comparing the glazes of ceramic vessels formed using early and late medieval techniques, we can observe that high lead content glazes which are low-melt glazes with the firing temperature around 700-850°C were replaced by lead-alkaline glazes whose firing temperature was around 850-940°C. In the latter the lower PbO content and the higher amount of alkaline oxides (K2O and Na2O ) as well as aluminium oxide (Al2O3) help suit the thermal expansion coefficients of the glaze to the ceramic body.

In the early Middle Ages, other glazed items were also known in Poland - including Easter eggs-rattles. Their surface is covered with opaque (single-colored or multi-colored) high-lead non-alkaline glass, almost identical to those used to make glass beads and glass rings. A comparative analysis of ceramics and Easter eggs showed that they were glazed in a completely different way.

The purpose of this paper is to show high lead glass as a glaze, which have been successfully used in the era of the early Middle Ages in Poland and Central Europe.
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### EARLY TO HIGH MEDIEVAL GLASS HOUSES IN THE UPPER WESER REGION, GERMANY

**Abstract author(s):** Wilke, Detlef (Dr. Wilke Management & Consulting GmbH) - Stephan, Hans-Georg (Institut fuer Kunstgeschichte und Archaeologien Europas, Archaeologie des Mittelalters und der Neuzeit, Martin-Luther-Universitaet Halle-Wittenberg)

**Abstract format:** Oral

Within the last decade several forest glass works have been archaeologically excavated and studied in the upper Weser region, Germany, including the so far earliest forest hut with kiln remains and glass pot fragments (crucibles) dating into the 9th century near Bodenfelde at the right banks of the Weser River. Most probably this hut worked in connection with the nearby Benedictine monastery of Corvey, which was granted imperial rights about Bodenfelde in 833. In Corvey relicts of Carolingian period glass working

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related to construction activities have been found too. A new phase of development, initiating the “classical” period of medieval and later forest glass huts is reflected by the excavation of glass works producing potassium and potassium-pewter glass from c. 1100 onwards in the vicinity of Corvey and the nearby Benedictine abbey of Helmarshausen, the place which traditionally is associated with Theophilus’ *Schedula Diversarum Artium*.

This and numerous other find places of forest glass production, most of them only studied by surface collection of vitreous drops and drippings as well as characteristic pot sherds, but often without finished glass relicts are difficult to be addressed as to which type of glass recipes has been applied there. The absence of finished glass relicts must either result from sole frit production, or from the poor preservation of potassium glass under humid, acid soil conditions over seven to twelve centuries. Unfortunately vitreous drops and drippings do not represent the actual production recipes in the glass huts, as we have learnt from large scale non-destructive XRF analysis of this frequent kind of by-product in modern glass works, but with recoverable K-Ca-glass remains. Conclusions on the effective glass recipe in find places without finished glass sherds are therefore difficult, and rather constitute probability assessments than data supported hypotheses.
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**GLASS OF 13TH CENTURY: PITFALLS OF ARCHAEOLOGICAL AND ARCHAOMETRIC STUDY OF FINDS FROM NW BOHEMIA**

**Abstract author(s):** Cerná, Eva (Institute of Archaeology of the CAS, Prague; The Institute of Archaeological Research and Preservation of Historical Monuments in Northwest Bohemia, Most)

**Abstract format:** Oral

In the history of European glass-making, 13th century was a period of utmost importance. Many changes were taking place also in Bohemia, including those in the organization and technology of glass production, and also in the structure of the source base now available to our study. Many uncertainties persist despite of the long-lasting interest of Czech scientists in the issue of glass-making in this period. Problems related to the typology as well as chemistry of glass artefacts remain unsettled. This is mainly due to the fragmentary character of their preservation and the poor preservation of glass material, i.e., corrosion reaching to its core. These factors have a negative impact on archaeological as well as chemical classifications of glass. Both of them reduce the informative value of the finds, eventually constraining the possibilities of the archaeologist, e.g., in the determination of glass provenance. Specific pitfalls of archaeological and archaeometric studies are documented by examples encountered within the evaluation of glass collections from northwestern Bohemia, particularly from the historical centre of the town of Most.
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**MEDIEVAL VESSEL GLASS IN SCANDINAVIA**

**Abstract author(s):** Haggren, Georg (University of Helsinki)

**Abstract format:** Oral

Vessel glass was not produced in Scandinavia before the 16th century. However, recent archaeological excavations have resulted large number of medieval glass finds in several northern countries. Like stoneware, glass was frequently imported to the Baltic markets. These imports consist of a wide range of chemical types of glass. In the late 13th and early 14th century this import of vessel glass consisted of exclusive lead glass and soda glass beakers as well as some ash glass of lower quality. In the late 14th and early 15th century lots of colourless or slightly greenish potassium-ash glass belonging to the Bohemian tradition replaced them on the northern markets. Number of these 14th and 15th century glass finds from Finland have been analysed and they show contents similar to several Bohemian finds.

The paper aims to analyse how contents and typology of glass opens possibilities to trace the origin of the glass vessels as well as Hanseatic and other trade routes heading to the north. Problems related to the analysis methods will also be discussed.
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**WHY RECYCLE GLASS? THE ANSWER IS CLEAR!: EXPERIMENTAL GLASS RECYCLING USING A WOOD-FIRED GLASSWORKING FURNACE**

**Abstract author(s):** Lucas, Victoria (Newcastle University)

**Abstract format:** Oral

It is important to include recycling in any big picture view of glass compositional analysis, and the study of the emergence of new glass groups, recipes, and technologies. In order to be able to unpick the complex tapestry of decisions and events that contribute to the final composition of a glass artefact, greater understanding of the effects of repeated recycling on glass is vital. This is particularly important for the period AD 700 – 1000, when evidence suggests that previously recycled glass formed a significant proportion of the pool of glass available for secondary production, and the intersection of recycling with the appearance of the first mixed alkali and wood ash glass compositions in the eighth century.

Reliance on anecdotal information from modern glassworkers – working with electric and gas fired furnaces; with highly oxidising atmospheres and stable, high temperatures – has led to the widespread assumption that glass can only be recycled a very limited number of times before it becomes unworkable due to loss of flux. However, an accurate picture of recycling in antiquity cannot be obtained without taking into account the impact of the use of a wood fire on the furnace environment and temperature regulation; and their effects upon the chemical composition and working properties of glass.

This paper will discuss, and present the preliminary results of, the first experimental work to test assumptions about how we can

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recognise past glass recycling, and the effects of repeated recycling on glass, using period appropriate fuel and furnace structure. The work adopts an approach combining experimental archaeology, chemical analysis, and expert craftsperson knowledge; to produce a picture of recycling that will deepen understanding of the links between craftsperson experience, chemical composition, technological practice, and object biography.
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**DOCUMENTATION OF MELTING EXPERIMENTS IN A WOOD-FIRED FURNACE AND THE NEED FOR ARCHIVING**

**Abstract author(s):** Staššíková-Štukovská, Danica (-)

**Abstract format:** Oral

In the year 2017 we reconstructed a glass furnace from the 9/10th centuries in the archaeological park at Hanušovce nad Topľou according to the find Devínska Kobyla in Bratislava. In the years 2017–2019 we realized a series of melting experiments focused on soda lime and soda-wood ash glasses. Glass batches were made from precisely weighed and chemically determined raw materials. Melted glass was analysed using archaeometric methods. All observations and analytical data were recorded in detail during the experiment as a basis for the publication and interpretation of these experiments in future.

Melting of historical batches in reconstructed wood-fired glass furnaces is currently also conducted in the archaeological parks at Elsarn and Asparn (present-day Austria) or at Havlíčkův Brod (Czech Republic). From the past, scientifically beneficial melting experiments at Moldava, supervised by E. Černá, should be noted. These examples suggest the specificity of this type of experiment-related documentation compared to archaeological and archaeometric reports and protocols. It should be noted, no rules for this type of experiment-related documentation have been established either in Slovakia or in neighbouring countries of central Europe. All these experiments yield important data of universal value to be used in interdisciplinary research of historical glass, but future use of such data is questionable if no information is preserved on where this experiment-related documentation is kept.
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**FROM SKYSCAPE TO ARCHAEOLOGY. A DYNAMIC INTERACTION BETWEEN DISCIPLINES**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Balbi, Jose Nicolas (Secretaría de Cultura y Educación, Buenos Aires; Colchester Archaeological Group) - Iwaniszewski, Stanislaw (State Museum of Atrchaeology, Warsaw) - Martz de la Vega, Hans (Escuela Nacional de Antropología e Historia)

**Format:** Regular session

The study of landscapes and skyline from archaeological contexts may include many disciplines which range from archaeological excavation to astronomical research: Archaeology, Astronomy, Geography and History. Each of these areas of study has a part to play in the understanding of an archaeological context. Therefore some of the questions that the papers for this session should address and by evaluating archaeological sites with the above criteria are:

Would our understanding of how peoples lived in their environment be improved by interaction with landscape observation and study, astronomy or any other aspect from an archaeological site? Would we be able to understand their culture and rituals in more depth? How do the study of astronomy and the landscape help us add a new dimension to our archaeological work? How does technology and new techniques enable us to understand the known data?

Only through the examination of the complete areas of study can we understand how people interacted with their landscape and perhaps enable us to understand their culture and rituals in more depth.

These topics will be addressed with the contributions of experts working in various fields: Animated landscapes, archaeology, anthropology, astronomy, ethno history, geography, planning, filming, photography and history.

The objective of the session is to achieve the presentation of archaeological works with multidisciplinary contributions, in which archaeological research is complemented with the contribution of other sciences or study methods in the aforementioned areas.
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**TESTING THE SKYSCAPE CONCEPT AT OŻARÓW - MIERZANOWICE MICROREGION OF THE MIERZANOWICE CULTURE**

**Abstract author(s):** Iwaniszewski, Stanislaw (Posgrado en Arqueologia Escuela Nacional de Antropologia e Historia - Instituto) - Gruzdź, Witold (State Museum of Archaeology, Warsaw)

**Abstract format:** Oral

The cemetery located in the eponymous Mierzanowice site 1 appears to exhibit some cultural traits of some earlier Neolithic traditions such as the Corded Ware or Bell Beaker Cultures. Inhumation practices included gender-determined positioning of the dead (females on the left side, males on the right) along the E-W axis. Since the funerary patterns seem to indicate the Mierzanowice Culture societies developed structured ideas about the cosmos and the afterlife, we should think of the environment of which they were part as a medium through which the dead people were related both to the non-human beings and living societies. The predominance of the East-West axis might emphasize society’s relation to the rotating sky.

During the development of the Mierzanowice Culture (2200 - 1700 BC), the neighboring mining field called "Za garncarzami", where a local chert called Ożarów flint, was also heavily exploited. Archaeological research revealed the functioning of workshops near-by the mining field where the selection of flint material and its thinning took place. These mining activities display a different set of human-environment relationships. There could have been fixed (and more static) associations between the natural features of mountains, rivers, farmlands, forests, and settlements and the mining field itself.

In this paper, we propose to test the concept of skyscape to describe the ways in which the Early Bronze Mierzanowice peoples could have been engaged with the sky.

2 **ANIMATED PEAKS, WINDS, RAINS, AND CALENDAR NUMBERS IN SKYSCAPES OF CENTRAL PREHISPANIC MEXICO**

**Abstract author(s):** Iwaniszewski, Stanislaw (Posgrado en Arqueologia Escuela Nacional de Antropologia e Historia - Instituto)  
**Abstract format:** Oral

An abundant ethnohistorical, ethnographic, and archaeological record links the Central Mexican Altiplano lanscape with skyscape. While elevated mountainous peaks and ridges have been viewed as animated and sacred, the ritual places located within the landscape were visited on occasions to be enmeshed, along with other aspects of the environment. Ritual activities in Mesoamerica coordinated the 365-day vague calendar with the 260-day divinatory cycle, producing ritual periods divided up into groups of days, 4, 5, 7, 9, 13, 20, and their multiples. On the one hand, it was the 260-day calendar that controlled the timing of those rituals; on the other, they were strictly related to essential agricultural activities depended on the vague solar year. Ritual ceremonies were associated with the arrival of the rains, the growth and harvest of the maize crop, and the fertility of the earth in general.

Some of the prehispanic ritual places where we can infer such rituals were performed bear also the remains of ritual-calendrical counting devices displayed onto rock outcrops. A lot of such sites have been discovered in the Southern Valley of Mexico. The present paper will report on findings of such calendrical markers in the region of Amecameca, State of Mexico.

3 **TATABUELO-SAN MARCOS AND THE PILGRIMAGE TO THE SACRED HILLS: THE RITUAL LANDSCAPE AND ITS MYTHICAL SUSTENANCE IN AZOYÚ, GUERRERO, MEXICO**

**Abstract author(s):** Martz de la Vega, Hans (National School of Anthropology and History) - Pérez Negrete, Miguel (Instituto Nacional de Antropología e Historia, México)

**Abstract format:** Oral

This paper presents the diachronic analysis of the construction of a ritual landscape for the ethnic group of the Me'phaa or Tlapane-cos in the municipality of Azoyú, Guerrero State, on the Mexican side of the Pacific Ocean. Here, the farmers consecrate the space to the agricultural cycle, by visiting sacred hills throughout the year. According to a myth recovered ethnographically, it is the divine entity Tatabuelo-San Marcos, turned into smoke, who taught them the pilgrimage route. Thus, through the analysis of the myth, the character that they grant to the hills as a dwelling of spirit entities can be verified, where vestiges of pre-Hispanic altars lie, understanding how the existence of a sacred geography has remained throughout the centuries. Making an interdisciplinary study between archeology, archaeoastronomy and ethnography, field work was planned, with the participation of medical men (rezanderos). The sacred hills, altars, remnants of pyramidal structures, rock art, stone seats and alignments were recorded. Together, it identifies the notions of the pre-Hispanic religion that has endured to this day.

4 **THE ROCK ART MANIFESTATIONS AND THE SUN AS A SKYSCAPE. LAS GRANADITAS, GUERRERO, MEXICO**

**Abstract author(s):** Martz de la Vega, Hans (National School of Anthropology and History) - Pérez Negrete, Miguel (Instituto Nacional de Antropología e Historia, México)

**Abstract format:** Oral

In the State of Guerrero, Mexico, there is an archaeological site of rock art manifestations consisting of a dozen stones engraved at the foot of a hill of small dimensions near the Pacific Ocean and at the end of the mountains. The engravings of Las Granaditas have been identified with aspects of the worldview of Mesoamerica related to the sacred spaces of the underworlds and the heavens. In addition to the above, the representations are oriented with astronomical principles, specifically with the Sun and with the cardinal directions such as, for example, the schematic maps of the Mesoamerican cosmos. The central point is that the landscape plays an essential role in which the main marker in the solar arc of the local horizon is a large mountain through which the Sun rises in the days of the zenith passage. From this we can relate the graphic elements with the movement of the Sun throughout the day and at night through an ancient interpretation of the pre-Hispanic codices in which Eduard Seler related the daily rise and fall of the Sun with the levels of the heavens and the underworlds precisely from a representation that also appears in Las Granaditas. The chronology of the engravings belongs to the Postclassic Period (900-1521 AD) in the same way as the documents consulted by the German sage. So the archaeological context depending on the Sun makes Las Granaditas a skyscape.

5 **THE SEGMENTED WALL OF THE SHINCAL. AN ASTRONOMICAL ARCHAEOLOGICAL PERSPECTIVE ON AN INKA CONSTRUCTION MADE IN THE SOUTH AMERICAN ANDES**

**Abstract author(s):** Balbi, Jose (Colchester Archaeological Group; SIAC) - Corrado, Gustavo (FCNyM - Universidad Nacional de La Plata)

**Abstract format:** Oral

Our work will reveal an archaeological astronomy perspective of this important site which is the greatest Inka construction south the capital Cusco. We have carried out several excavations and produced interpretative reports in the last five years. This work discovered a feature of particular importance: A cardinally oriented wall (north-south) within the main square of this sacred pre-Hispanic site.

Architecturally The Shincal de Quimivil shows us evidence of some important structures of astronomical and landscape alignments which forms a cartography that is strongly related to the idea of a sacred landscape that has a connection with the stars, the calendric meditations and the landscape.

All the buildings make up the complex of a large site with a fundamentally ritual nature which was created by the careful planning by the Inkas architects. In our case of study, within the great square, a particular structure has drawn our attention, a large wall of 58 meters in length divided into five segments which corresponds to each of the four divisions and built with selected edged rocks.

We will describe this archaeological phenomenon, the context of the Inka site and the similarities with other ritual and power centres of the Inka Empire, studying the possibility of astronomical observation centres, calendrical calculations and the possibility that the construction constitutes an ancient solar meridian.

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6 **THE FORDHAM HALL ROMAN VILLA SITE. 3RD CENTURY BUILDING PHASE CLOSE TO COLCHESTER, THE FIRST CAPITAL OF THE ROMAN BRITANNIA**

**Abstract author(s):** Balbi, Jose (Colchester Archaeological Group) - Lockwood, Frank (Colchester Archaeological group; CAG)

**Abstract format:** Oral

Our presentation will describe the early stages of the excavation process in Fordham, Essex, England; a small town built around an ancient route and a Norman church from the 11th century. Researchers began in a cultivation field where an ancient burial of two bodies, supposedly Saxons, had previously been found. The group responsible for the cultural and historical heritage of the city, the Fordham Local History and Archeology Society, contacted the experienced group of the neighboring city, the Colchester Archaeological Group, with more than a century of archaeological experience and who actively work in various excavations in and around the city.

Our presentation will go back in time and will discuss the architectural and material findings of a possible medieval construction, the archaeological work in the period of greatest splendor during the Roman occupation of Britannia, and the possibilities of transforming an urban villa into a rustic one. We will also describe the current context of a project with the idea of a Roman villa in its greatest splendor between the second and third centuries, located seven kilometers from the city and its possible construction on a previous Neolithic settlement.

The presentation will be with all the data obtained from the prospection to the present, where we continue digging for the fifth consecutive year, while we wait for the news of this exciting and interesting archaeological site in full excavation.

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a. **THE POWER OF LIGHT AND DARKNESS: THE ILLUMINATION PHENOMENON OF CUEVA MERINEL (BUGARRA, VALENCIA, SPAIN)**

**Abstract author(s):** Machause López, Sonia (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de Valencia, Grup de Recerca en Arqueologia del Mediterrani - GRAM) - Esteban, César (Instituto de Astrofísica de Canarias and Departamento de Astrofísica, Universidad de La Laguna) - Diez, Agustín (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de Valencia), Grup de Recerca en Arqueologia del Mediterrani - GRAM)

**Abstract format:** Poster

Why some caves far away from the main settlements were chosen between the 5th and 3rd century BC and became ritual spaces?



The answer to this question can be read not only on the materiality of these contexts and their landscape symbology, but also on their natural and, sometimes, modified, physical characteristics.

Astronomy can help us to understand the predilection of certain caves instead of others. It may not be the only reason, since the cave itself, its ritual memory and its location on the limits of the territory played an important role when choosing this kind of ritual spaces in the Iberian Iron Age. However, illumination phenomena would be one of the variables that guided the Iberians to choose one specific cave and, what is even more interesting, it could guide the ritual calendar.

Like in other archaeoastronomical studies in ritual caves, Cueva Merinel seems to have this special illumination phenomenon. This cave was the scenario of repeated offerings. The pattern identified in the ritual deposit, located in one of the darkest spaces of the cave, was characterized by a selection of cranial parts of neonates and young pigs and ovicaprids, which were deposited along with ceramics vessels like plates and vases. The space is quite intriguing, since some of the three openings play a role in the game that sunlight creates with the multiple stalagmites and stalactites that invade the space. However, there is one area from the central entrance, which seems to have been artificially modified, that would only be illuminated during a short moment around the summer solstice sunrise. This kind of symbolic phenomena may have marked the dates of the pilgrimage undertaken from diverse habitat places to this sacred cave, located on the south limit of the Iberian territory of Edeta.

## 176 SMALL AND COMPLEX. NEW ANTHROPOLOGICAL AND ARCHAEOLOGICAL PERSPECTIVES ON MINIATURIZATION

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Zamboni, Lorenzo (University of Pavia) - Barfoed, Signe (University of Oslo; University of Reading) - Da Vela, Raffaella (University of Tübingen) - Meneghetti, Francesca (Goethe University, Institut für Archäologische Wissenschaften)

**Format:** Regular session

Miniaturization is a cognitive and manufacturing process widespread among human societies. However, only in recent years has attention been paid to the significance of smaller objects within the field of archaeology and anthropology. Previous studies have underestimated miniaturization, considering their products only as mere simplifications, as means of ritual and cultic practice, or as cheap reproductions of normal-sized objects.

Objects in a reduced scale are however tangible products of social activities; cognitive and physical experiments conducted by active and conscious agents. Various specialised techniques, skills, and perceptions are required during the process of miniaturization. Paradoxically therefore, the smaller a miniature becomes, the more complex it often can be.

The aim of this session is to highlight miniaturization as a key feature for the understanding of both ancient and present societies. We particularly welcome contributions dealing with alternative approaches to the understanding of miniaturized objects, including:

- Small things, big networks. Since miniaturized objects are easy to transport and exchange, which role do they play in contact zones and the cultural transmission of forms and practices?
- The small and the sacred. Can miniaturized objects in cult contexts be assumed as proxy for ritual activities?
- Small dimensions, diminished value? Miniaturisation does not imply devaluation, but rather a change in function and value. Is there a semiotic relationship between the miniature and its counterpart/prototype?
- Size matters. Which cognitive and psychological approaches are possible to understand the perception and use of objects?

We encourage papers covering different periods, from late prehistory to present-day societies. We are interested in advancing the theoretical and practical study of miniaturization, both in anthropology and in archaeology, beyond the boundaries of disciplines.

## ABSTRACTS

### 1 MINIATURE OBJECTS AND MINIATURIZATION: A NEUROSCIENCE-HUMANITIES APPROACH

**Abstract author(s):** Pilz, Oliver (University of Jordan; University of Mainz)

**Abstract format:** Oral

Miniature objects are an intriguing facet of the material record of many premodern and modern cultures throughout the world including our own Western society. In fact, miniaturization is a recurrent pattern of human material behavior from the Palaeolithic period onward. Though frequently marginalized by modern research, miniatures function(ed) in central ways upon the social life of the human beings experiencing them in contexts as different as, for instance, play and ritual.

The wide dissemination of the phenomenon in time and space supports the hypothesis that the efficacy of miniaturization hinges on specific cognitive processes. For one, miniatures are hypothesized to allow for efficient representations in brain and mind, which would facilitate the ease of memory encoding and retrieval as well as promote social communication. However, neuroscience research on the perception and recognition of miniature objects as such has not yet even begun.

The aim of the present paper is therefore to outline a possible cross-disciplinary collaboration between humanities, in this case social archaeology, and cognitive neuroscience. In doing so, we hope to get a better understanding of the role of miniature objects in shaping and negotiating social values, identities and perceptions, while also revealing how artifacts have evolved over the years to

optimize the fit with mental operations in the brain.

2

### A MINIATURE POTTERY ASSOCIATED WITH THE INCA RITUAL OF CAPACOCOA

**Abstract author(s):** Siemianowska, Sylwia (Institute of Archeology and Ethnology of the Polish Academy of Sciences; El Centro de Estudios Andinos de la Universidad de Varsovia en el Cusco - CEAC UV) - Perea Chavez, Ruddy (Museo Santuarios Andinos)

**Abstract format:** Oral

One of the most momentous of Inca state ceremonies is known as the capacocha. It involves a human sacrifice and its accompanying sumptuary offerings like: ceramics, human statuettes and llama figurines that have been crafted with gold, silver, and spondylus, textiles, clothes, jewellery, gold, silver, and bronze pins. Most of the ceramics associated with this special ritual were miniaturized and appeared in pairs. The present study focuses on the ceramic component of the funerary assemblages from two volcanoes in the department of Arequipa region (southern Peru) - Misti and Ampato, compared to other finds of this type from the Inca empire.

The capacocha remains associated with Mt. Ampato were discovered in 1995-1997 by J. Reinhard, M. Zárate. The first individual (famous Juanita) was discovered out of situ and in disarray some 70 m below the remnants of the summit platform (5852 m). Three more bodies (two girls and one boy) were discovered within the ceremonial platform. One year later, in 1998, another capacocha remains were discovered at Mistii on the ceremonial platform aprox. 5300 m by J. Reinhard and A. Chavez. found 2 graves with 2 ceremonial sacrifices in each one and 8 or 9 individuals of age 6-7, 9-10 and 13 years were found. Regarding ceramics, 38 very small and miniature clay pots from Ampato and 35 from Mistii were found. The archaeological material from this two site is in the collection of Andean Sanctuaries Museum in Arequipa.

3

### LIVING IN THE SMALL WORLD. CREATING ATTITUDES IN POST MEDIEVAL, MODERN AND CONTEMPORARY GDAŃSK

**Abstract author(s):** Dabal, Joanna (University of Gdansk)

**Abstract format:** Oral

In this paper author will present selection of miniature items including those made of clay, metal and wood. The collection of miniature objects has been excavated in Gdańsk urban area. Most of them were found at archaeological sites located in housing areas, canals and fortress. With use of contemporary archaeology abstract figures those archaeological finds will be visualized in background of chosen periods from post medieval, modern and contemporary (16th to 21th century). The main goal of this presentation is to search miniature finds broad interpretation. Selection of religious finds, toys or propaganda items will be shown in conventional archaeological interpretation contexts and their alternative meaning referred to different periods or ideas. Confronting ideas of small things for chosen periods is crucial for further discussion.

Furthermore some introductory remarks will be given to possibility of conceptualizing other than material world on the bases of small things. The general idea of implemented discussion based on presentation of archaeological finds from Gdansk is how much we can tell as an archaeologists about small things without creating ideas which are out of the human and time context.

4

### THE RITUAL AND SECULAR USES OF MINIATURE POTTERY IN BRONZE AGE CRETE

**Abstract author(s):** Dewan, Rachel (University of Toronto)

**Abstract format:** Oral

Miniature vessels have been considered “commonplace” at Minoan sacred sites since their discovery at the peak sanctuary of Petsofas in 1903. Since then, their presence has been noted not just in ritual spaces such as peak sanctuaries, sacred caves, and domestic shrines, but also in Minoan palaces, houses, storerooms, and manufacturing areas. Nevertheless, their association with the ritual sphere has remained dominant, and miniature ceramic vessels are often perceived as material indicators of ritual activity regardless of broader contexts or assemblages.

This paper challenges the traditional ritual assumption of Bronze Age miniatures, advocating for a more nuanced and complex perspective for this class of objects. Using the results of a study of nearly 600 miniature ceramic vessels from thirteen sites across Crete, it suggests that while miniature vessels are present at sacred sites, their quantities and significance have been overstated in the archaeological literature. When they do appear in ritual contexts, however, Minoan miniature pots are notably less detailed than their secular counterparts. Rather than maintaining any heightened level of detail or decoration, the emphasis of small-scale pottery in sanctuaries or shrines seems instead to have been on the abstraction of the diminished form. By compressing details and condensing meaning, a miniature object provided the worshipper with a material scaffold, physically aiding the human mind in comprehending the unobservable in a tangible way. By combining theoretical approaches from the fields of archaeology, art history, material studies, and cognitive studies with archaeological data, it is suggested that miniature pottery of the Bronze Age Aegean served multiple functions and took various forms, but that ritual activity was evidently the most complex.

5

### PUTTING MINIATURISATION TO THE TEST: AN EXPERIMENT

**Abstract author(s):** Meneghetti, Francesca (Goethe Universität)

**Abstract format:** Oral

Although miniaturisation is a visible and easily identifiable phenomenon, scholars paid it scant attention. However, recently more

researchers, both in archaeology and anthropology, have analysed and theorised this phenomenon. Nonetheless, miniaturisation and miniatures remain marginal in the Humanities.

My doctoral research focuses on miniature oxhide ingots from Late Bronze Age Cyprus. I revised their archaeological contexts and the function of some pieces, adopting an interdisciplinary approach which mixes archaeology and anthropology. I used concepts, such as affordances, qualia and semiotic ideology (see Davy 2017) combined with the analysis of the findspots, to explain the possible function of some miniature ingots in the Late Bronze Age Cypriot society.

During my work within the framework of the RTG "Value and Equivalence", I participated in an exhibition, where I presented part of my research. To further engage the public in the topic, I designed a brief questionnaire, which asked the visitors whether they had miniatures and how they dealt with them. I wanted not only to test my hypothesis about the miniature ingots but also to deepen the relation viewer-miniature and the reactions emerging from it, as appeared from recent miniaturisation studies (see Kohring 2011; Langin-Hooper 2015; Davy 2017).

Thus, the paper will show the results of this small experiment. The aim is to open a discussion about miniatures, miniaturisation, and the application of miniaturisation theories in our researches.

6 THE RITUAL SIGNIFICANCE OF MINIATURE VESSELS IN ANCIENT GREECE

**Abstract author(s):** Spathi, Maria (Society of Messenian Archaeological Studies)

**Abstract format:** Oral

Thousands of miniature vessels came to light in Greece, mostly from excavations in sanctuaries in the 20th century. Although they seemed to be a popular offering from the geometric period and onwards, they were for a long time set aside in studies, as cheap and worthless substitutes of normal pottery. Nowadays however, we can claim that these objects are significant in various ways and can be seen to constitute a category of their own.

The miniature pottery from the sanctuaries of ancient Messene and especially those unearthed from a closed deposit in the sanctuary of a female Goddess on Mount Ithome will be presented in this paper. This assemblage prompted the study of the context, in which miniature pottery can be generally found, and, consequently, its use and significance as regards ritual praxis. The presence of miniature pottery seems to constitute a characteristic feature of specific rituals and cult practices within a profane, as well as a sacral context. Miniature vessels have primarily a functional significance and, secondly but not least, a symbolic one. They were filled with the appropriate contents and also used in the ritual forms they symbolically represented.

The material from Messene compared with finds from other regions in the Greek world will be presented and discussed in the paper in order to reveal the use of miniature pottery as appropriate to specific rituals and, possibly, to specific cults.

7 MINIATURE POTTERY FROM ABDERA, AEGEAN THRACE, FROM THE ARCHAIC TO THE HELLENISTIC PERIOD

**Abstract author(s):** Motsiou, Paraskevi (National Kapodistrian University of Athens)

**Abstract format:** Oral

Extended excavations during the years 1982-1993 revealed a small but important part of the northern fortification of the archaic and classical city of Abdera: part of the walls and a gate, buildings and a sanctuary, as well as the archaic and hellenistic cemeteries. Very few miniature vases were found at the archaic cemeteries, but an unexpected deposit containing almost 20.000 miniature hydriai -among hundreds of figurines and other pottery- contributes in identifying the revered goddess as Demeter, but also functions as a starting point of the studying of miniature pottery in aegean Thrace and northeast Aegean. Furthermore, recent surveys conducted by the Ephorate of Xanthi and the University of Athens at the urban area and classical and early hellenistic tumulus cemeteries at the chora of Abdera provide an insight into the dispersal of miniature pottery in these areas.

This paper aims to observe the usage of miniature pottery in Abdera from the archaic to the hellenistic period: firstly, whether a change in function is traceable, when found in different contexts, cult, sepulchral or domestic/urban. Moreover, the symbolic aspect of this class of pottery will be examined, taking into account the nature of the contexts that was used for and the function of the natural size vases that is based on. Lastly, some subgroups of miniature hydriai from the sanctuary of Demeter bearing post-firing slots and holes on their bodies and bases will be the basis of the argument that miniature pottery in cult context was not only votive, but was also reused for many and different purposes.

8 A LITTLE LIQUID. THE ROLE OF MINIATURE OBJECTS IN THE EXPLOITATION OF WATER RESOURCES

**Abstract author(s):** Zamboni, Lorenzo (University of Pavia)

**Abstract format:** Oral

This paper explores the spectrum of interaction occurred in the past between small things, liquids and waterscapes.

The selected case-study is the region bordered by Alpine arch to the north and the Apennines ridges to the south, in a period between the Bronze Age and the whole 1st millennium BCE. Here, the abundance of water resources, being rivers, streams, lakes, swamps, and spring sources, has long time influenced the human adaptation, leading to early technological improvements in hydraulic management. The choice of settlement patterns through millennia has itself been modelled by waterscapes, from pile-dwellings,

the Terramare structured villages, to the timber enclosures and log buildings of later towns.

In this framework, the role of miniatures, provided in remarkable quantity and variety, has been underestimated by previous studies. A rather uncritical interpretation of small vases and figurines from the region addressed points in fact to cult practices or, less frequently, toys.

In this paper I shall address the occurrence between small objects, water resources and hydraulic structures, trying to envisage alternative scenarios of functional or symbolic meanings.

A key aspect is perhaps to highlight the role of miniature vessels as containers of various substances, including liquids, with eventual special functions in the practical and social dynamics. Furthermore, the agency of small things in relation to water management, cult activities, and the creation of 'liquid' landscapes will be explored.

9 SMALL POTTERY, BIG NETWORKS. MINIATURE POTTERY AS A PROXY FOR THE FORMATION OF PRE-ROMAN COMMUNITIES OF PRACTICE ACROSS THE APENNINE

**Abstract author(s):** Da Vela, Raffaella (SFB1070 RessourcenKulturen University of Tübingen)

**Abstract format:** Oral

This contribution inquires the role of miniature pottery in the diffusion of cult practices. The particular focus lies on the creation of diffused sacred landscapes in contact zones across the Apennine. The main research questions cover the agency of miniature pottery for sharing cult practices, as well as the relationship between typology and function of this pottery in local communities with different cultural backgrounds. The communities on both sides of the Apennine show elements of a mixed culture or instead of oppositional identities, related to their location within geographic and economic contact zones with high personal mobility.

The distribution patterns and contexts of miniature pottery will be analyzed within two areas, the Tuscan-Emilian Apennines in Northern Etruria and the Samnite-Lucanian Apennines in Southern Samnium (Hirpinia). The distribution patterns of miniature pottery in these two regions will be analyzed and compared in their dynamic between the 6th and the 2nd century BCE. A particular attention will be paid to the pottery's function in social rituals and contexts. The semiotic network based on the presence and use of similar forms of miniature pottery will be related to the adoption of common cult practices as well as to the rise of central places of natural and healing cults on the Apennine. The diffusion of skills and knowledge necessary to produce and miniature pottery and use it in the ritual will be discussed in the major framework of the formation of transcultural communities of practice.

a. CASALE PESCAROLO IN CASALVIERI (FROSINONE, ITALY): A PRELIMINARY STUDY ON MINIATURE WEAPONS AND BRONZE SHEET FIGURINES

**Abstract author(s):** Marazzi, Elena (University of Pavia)

**Abstract format:** Poster

This paper aims to illustrate the phenomenon of miniaturization in cult contexts through the case study of the Casale Pescarola Sanctuary in Casalvieri (Frosinone, Italy).

This sanctuary was built at the foot of the Vicalvi settlement, along the route connecting inland southern Lazio to Abruzzo, and was used from the end of 7th to 1st century BC.

During the earlier phases of the votive deposit, between the late 7th and 5th centuries BC, both bronze weapons and anthropomorphic bronze sheet figurines of the Umbro-Lazial tradition were affected by a miniaturization phenomenon.

Although the metal and the small size made these objects fragile, at the same, they were easy to transport, and we can find them in many sites along the Apennines.

The subjects and the attention to detail demanded a high degree of technical skills, the necessity of which was motivated by the symbolic and semantic value attributed to the objects by the worshippers.

Perhaps the miniaturization process could be related to the ritual throwing of the votives into a pond, already hypothesized for the first phases, without reducing that practice to a simplification induced by economic reasons.

During the later phases, the miniaturization was replaced by the offering of real weapons, according to the Hellenistic cult traditions.

Since this phenomenon is well known at Satricum and in other central-southern Apennine sanctuaries, this paper will provide a brief overview of the findings of sheet figurines and bronze miniature weapons in the area. In particular, I will focus on the contexts in which these two types of artefacts were in association or linked to the water cult, to investigate the possible relationships between miniaturization and ritual practice.

CHALLENGE, CHANGE, AND COMMON GROUND: THE ROLE OF SOCIALLY ENGAGED PRACTICE IN COMMUNITY ARCHAEOLOGY IN MODERN EUROPE

**Theme:** 1. Networks, networking, communication: archaeology of interactions  
**Organisers:** Belford, Paul (Clwyd-Powys Archaeological Trust) - Almansa Sanchez, Jaime (JAS Arqueología) - Foreman, Penelope (Clwyd-Powys Archaeological Trust)

**Format:** Session with precirculated papers

Europe is divided. Nations and nationalities and identities are drawn, redrawn, refuted, rejected, and re-defined in a constant cycle of conflict and change. Narratives of both belonging and othering are constructed, and the past is a tool in their construction. Archaeological research is reported and re-framed to form ‘evidence’ for ideological arguments from across the political spectrum. At the same time, heritage sites, public bodies, academic institutions, and community projects are under intense political pressure to quantify their social impact and ‘value’. This is largely measured economically, using inadequately designed monitoring and evaluation tools that struggle to capture the personal, wellbeing, cultural impact of archaeology on individuals and communities. Borders across which collaboration previously flowed are closing, stifling the passage of both archaeologists and archaeological discourse. Archaeology as a discipline is beginning to act upon broader societal changes, such as the need to examine decolonisation of its practice and the admission of a lack of diversity - but this change has come slowly and not without contention and conflict.

The community archaeologist can be neither apolitical nor apathetic in the face of these challenges and changes. The tangible and intangible barriers to access of archaeological sites, projects, and research must be navigated through practice that balances accessibility, innovation, and inclusion with quality research and impactful outcomes.

This session invites contributors working on socially engaged practice - that which has a co-creative, democratic, community-driven, inclusive, value-driven design and implementation - to share their successes and failures in this field, and hold a wider debate on its value and impact upon both archaeology and the public perception of social issues in Europe today.

ABSTRACTS

1 LOVING THE ALIEN: UNLOVED HERITAGE, ISOLATED YOUTH, AND CONFLICTING IDENTITIES EXPLORED THROUGH ARCHAEOLOGY AND HERITAGE IN RURAL WALES

**Abstract author(s):** Foreman, Penelope (Clwyd-Powys Archaeological Trust)

**Abstract format:** Oral

Unloved Heritage is a Wales-wide Heritage Lottery Funded youth-led project aimed at highlighting areas of Welsh heritage that are overlooked, uncared for – unloved. It relinquishes the platform of heritage interpretation from traditional voices and sources, and instead turns it over to young people.

For the Clwyd-Powys segment of this project, this has meant a total re-evaluation of what it means to be a young person engaging in the past in Wales today. From their conflicted opinions on rural life in the past, to their priorities for what to preserve for the future, the project is a learning experience for anyone seeking to understand the difficulty faced by young people in constructing their identity and place in Wales today.

Working on youth-led projects raises difficult questions for archaeologists - what do we mean by value, valid engagement, or even the word heritage itself? How do we work with young people who don’t have the vocabulary to speak about their relationship with the past and expect them to articulate it? How do we open up spaces like museums, archives, and archaeological sites when there is a fundamental sense of them being, as the young people say “not for us”? When a section of our audience feels like a thoroughly alien “other”, how do we convince them otherwise?

This paper shares some lessons from working on Unloved Heritage - from the minor to the major - and offers practical advice for anyone seeking to undertake genuinely impactful, socially activist practice in community archaeology involving young people.

2 UNDERSTANDING, CAPTURING AND MEASURING SOCIAL IMPACTS OF PARTICIPATIVE COMMUNITY ARCHAEOLOGY: NEW APPROACHES FROM THE NETHERLANDS, CZECH REPUBLIC, POLAND AND UK

**Abstract author(s):** Lewis, Carenza (University of Lincoln) - van Londen, Heleen (University of Amsterdam) - Marciniak, Arkadiusz (Adam Mickiewicz University in Poznan) - Vareka, Pavel (University of West Bohemia)

**Abstract format:** Oral

The EU-funded Horizon2020 project “Community Archaeology in Rural Environments Meeting Societal Challenges” (CARE-MSoC) aims to help the heritage sector in Europe tackle social challenges by making community more widely accessible, and advancing understanding of how this benefits rural people and places, including by drawing together people and communities. Over three years (2019-22), CARE-MSoC researchers are involving hundreds of members of the public in the Netherlands, Czech Republic, Poland and UK in excavating scores of test pits across their local villages, with the aim of simultaneously throwing new light on the historic development of the host settlements while also exploring the impact of the excavations on volunteers and communities. Test pit excavation is increasingly frequently used to investigate historic settlement development, but approaches to capturing the social impact of participation in such excavations remain much less developed.

DIGGING THROUGH PARTNERSHIPS AND COMMON GROUND

**Abstract author(s):** Oakden, Vanessa (Museum of Liverpool)

**Abstract format:** Oral

Community archaeology enables participants to come together from a range of different backgrounds to explore the past. Yet it is not just the archaeology which can be found; new skills, a sense of place, physical and mental health benefits and a sense of community all grow from community archaeology projects. Through partnership working the Museum of Liverpool’s community archaeology has been able to connect with people who may be unable or reluctant to engage with the past in a museum setting.

Partnerships present so many opportunities, the outcome is so much greater than the sum of its parts! By working with pupils with special education needs, engaging locals who feel second to tourism, popping up in supermarkets, running a Young Archaeologists Club and hosting the regional Portable Antiquities Scheme we have been able to explore archaeology with impactful outcomes. This paper will focus on key case study projects, for example the partnership with the Liverpool School of Tropical Medicine which has led to the first excavation of courtyard housing in Liverpool and provided the first archaeological contributions to the LSTM ‘Swab and Send’ project, to collect samples of bacteria to help with the development of new antibiotics. Working in partnership allows us to cross geographical and topical borders, but can also come with challenges. Archaeology is a story which belongs to everyone and yet too often is only accessible to a few, our aim is not to be gatekeepers of the past but to enable a diverse range of opportunities to explore it!

‘HOPE IN THE DARK’: CREATIVE ARCHAEOLOGIES AS POLITICAL INSIGHT AND ACTION

**Abstract author(s):** Hannis, Jodie (University of Leicester)

**Abstract format:** Oral

The uses and abuses of archaeology to propagate dangerous political agendas certainly seems to be in full swing at the moment. The fact that a significant amount of this comes from within our discipline is all the more alarming and makes present the need for deliberate, activist stances in both the work we do and the way we talk about it. It is offered here that methods of public archaeology that centre creativity, self-expression, and artistic engagements can provide unique insights into participants’ deeply held values on the nature and purpose of archaeology. Likewise, such activities can revitalise archaeologists and researchers at a time when neoliberal impact agendas in our institutions can lead to cynicism and alienation. It is argued than positive change is prefigurative and hope is there, if we allow ourselves to reach out to it. Through a discussion of the creative activities undertaken as part of the author’s PhD research, we will examine participants’ reflections on their own engagement with archaeology and we can see a strong resistance to insidious narratives of national identity, nationhood, and the role of history. Not only is working with the public a heart-ening antidote to the disillusionment and disenfranchisement of our times, through it we might together build an equitable practice which challenges hierarchies and democratises meaning-making while maintaining our ethical integrity.

NAVIGATING CLIMATE CHANGE CULTURE: THE IMPORTANCE OF ZOOARCHAEOLOGY IN THE DISCOURSE OF EXTINCTION

**Abstract author(s):** Pageau, Hanna (Cardiff University)

**Abstract format:** Oral

In the age of misinformation, the role of the Community Archaeologist has become dire, we exist in a world where our words can be used to divide and conquer, a world where if we aren’t careful our words end up weapons. We also live in a world where Community Archaeology has often focused on the most historical side of archaeology. One of the most important issues moving forward for humankind is climate change, something that effects the field of archaeology widely - but also effects your average person and will only effect them even more unless we begin to act. Zooarchaeology presents a unique lens with which to interact with the public - one that intersects between biology and conservation sciences and archaeology. This presentation will focus on the necessity of the presence of zooarchaeology in both Community Archaeological efforts and wider scientific outreach in helping to educate and combat climate change.



6

IDENTITY AS PEDAGOGY : A CASE STUDY IN SOCIALLY ENGAGED ARCHAEOLOGY

**Abstract author(s):** Stevens, Fay (University of Notre Dame in England)

**Abstract format:** Oral

This paper presents the outcomes of a new course in socially engaged archaeology taught at The University of Notre Dame (U.S.A.) in England. It considers why socially engaged archaeology is important and explores the contribution such an approach can make to the discipline and beyond. Themes include issues of voice, reflexivity, identities and a pedagogy of curation. This discussion will focus on research and collaboration with the challenging Crossbones ancient burial site in London and will make reference to student engagement with the locale and resulting research and outcomes. The focus of attention will be on the presentation of the site and its epistemology through a socially engaged lens. It will draw upon student research on the site, engagements with local communities and collaboration with the site curators, volunteers and the public. This will lead to a closer consideration on the topic and relevance of co-created archaeology as well as adopting a wider discussion on issues of identity and the philosophy of socially engaged archaeology.

7

FINDSAMPO - A COOPERATIVE CITIZEN SCIENCE PLATFORM TO MANAGE AND CURATE ARCHAEOLOGICAL FIND DATA IN FINLAND

**Abstract author(s):** Rohiola, Ville (Finnish Heritage Agency)

**Abstract format:** Oral

FindSampo (Fi. Löytösampo) is a web portal under development in Finland for archaeological finds made by public, particularly by avocational metal detectorists. The database is developed by the Finnish Archaeological Finds Recording Open Linked Database (SuALT) project. The four-year consortium project funded by the Academy of Finland involves the Finnish Heritage Agency (FHA), the University of Helsinki and Aalto University.

The goal of the project is to develop innovative solutions for reporting, researching and managing archaeological find data. As a result, FindSampo will provide public, archaeologists, and other researchers a web service to study find data and its spatial information online globally. For FHA, the platform will work as a tool to manage and curate disseminated find data and archaeological information. It will also streamline the processes of heritage management dealing with metal detecting. The database applies citizen science and activates participatory collaboration between the public, researchers and heritage managers.

Ontologies and metadata models are needed to represent archaeological information as a digital resource for research and for wider public. For Archaeological Collections it is essential that the self-recorded find data (by public) is compatible with the FHA’s collection management. The ontology infrastructure is needed to make linked data interoperable with national and international databases. For example, the concept-based ontology of archaeological object names, that the FHA has developed, is essential to record accurate and compatible find data. With formal data structures, it is possible to disseminate archaeological information for different user needs. This paper discusses the importance of open access data and public domain use of archaeological information, especially of archaeological object finds.

8

CONNECTIONS BETWEEN CIVILIANS AND PROFESSIONALS IN A SMALL HUNGARIAN TOWN – AND BEYOND THAT

**Abstract author(s):** Rózsa, Zoltán (Castle Headquarters Integrated Regional Development Centre Nonprofit Ltd.)

**Abstract format:** Oral

Orosháza is a small town in the south-eastern corner of Hungary. The local museum collects archaeological finds between the borders of 17 settlements. There live those 9 civilians, who help the museum’s professionals in collecting, registering, analysing and presenting the metal artefacts, taking part in cleaning or writing articles, too.

In some parts of Hungary, especially east of the Danube, metal detecting became popular later than in western parts. The situation can be considered quite good, because as opposed to the illegal detectorists, the rate of the provincialists is much higher. The museum of Orosháza is lucky, as all the 9 people do their detecting legally. Connections between those civilians and professionals formed in a remarkable way during the last five years.

The base of the relationship is formed of trust and partnership. The detectorists’ activity was legalized in 2015 and continued their work based on a protocol determined together with the museum. The people belong to the museum’s community from the beginning, they are equal members. They form research plans together with the professional archaeologists, they are involved in registration processes, and they offer their extensive relations to the museum.

The museum of Orosháza is thought to be a small institution in Hungarian system, it stands at the end of the line. However, every single result achieved by its volunteers can be important and useful for regional or national institutions, as regional museums meet especially the needs of the society, as well as the results of negative processes which were formed since the 1990’s. The „system of Orosháza” was made by myself together with my civil colleagues. Although since last October, I work by Castle Headquartes Ltd. as a national coordinator, but with a 22-year-long experience by a provincial museum, I am looking forward to meeting new challenges.

9

PUBLIC ARCHAEOLOGICAL ORGANIZATIONS ON THE BORDER OF EAST AND WEST

**Abstract author(s):** Gábor, Bakos (Herman Ottó Múzeum)

**Abstract format:** Oral

Public archaeology is in a unique place in Hungary, as it does not have longstanding roots. Civilians however, are getting more and more interested in the work of museums, partly because of the social media presence. This enthusiasm often fades, sometimes disappears completely. The museums are loaded down, thus can hardly open towards these inquiries. We lack the traditions that form the basis of these initiatives.

Change was brought to Hungary by the aggravation concerning the use of metal detecting equipment. Thus, only a handful of archaeology enthusiasts form the core of today’s civilian archaeological program. Therefore we can conclude, that the changes were given new momentum by the legal regulations, not by the people’s change of perspective. Nevertheless, these changes have birthed a number of successfull initiatives, as well as collaborations that are taking shape even in these days.

Answerably, the situation is not uniformed. Every institution tries to give adequate opportunities to the organizations in their own manner, and by their own capacity. These museums usually have serious struggles with their lack of funds and capacity. Nevertheless, they coordinate successfull and well functioning projects. Their structures are different, but their goal is the same: saving the homeland’s archaeological relics, despite the continuous headway of the illegal searchers.

Thus, Hungarian archaeology has to face a new challenge in a special situation with unique circumstances. Public archaeology has great traditions and projects in Western countries. Eastern states on the other hand has not yet created their own rules regarding the use of metal detecting equipment, or they are not taking them seriously enough. The unique characteristics that characterise national public archaeology have formed in this intersection.

10

COMMUNITY ARCHAEOLOGY INITIATIVES IN EASTERN EUROPEAN COUNTRIES

**Abstract author(s):** Wollak, Katalin (Independent researcher)

**Abstract format:** Oral

In the community archaeology sessions of the previous EAA conferences speakers from former socialist countries could report largely specific examples only. The main reason for this in most of these countries is that archaeological finds are state property, and consequently not only their possession and collection, but also their research is strictly regulated. In several countries, archaeological investigation requires individual license. All of these hindered the participation of volunteers in various archaeological activities, and besides, volunteering was essentially based on different social traditions.

This practice has been transformed in certain Eastern European countries in recent years partly due to a change in attitude towards metal detecting. Estonia was the first country that introduced new regulation in 2011; issuing license and allowing certain activities under defined conditions; later on similar procedures were initiated in other countries. Cooperation with law-abiding metal detectorists began in many countries under strict conditions, including theoretical and practical training, close cooperation with archaeologists in different types of institutions and providing guidance on the obligatory documentation techniques.

There are numerous further developments, e.g. civil society organizations were launched in order to promote community archaeology and to prevent illegal archaeological activities. The scope of activities in these communities is widening, volunteers are involved in site exploration, minor archaeological excavations and conclusive mapping of archaeological sites. These practices help archaeologists in gaining new information but requires various types of intensive cooperation. What is more important, it provides an opportunity for local communities to understand better the archaeological heritage of their historical environment while engaging in their preferred pastime.

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FROM ROCK TO METAL (DE LA ROCA AL METAL).

**Abstract author(s):** Lerma Guijarro, Alma (Backset Archaeology; De la Roca al Metal)

**Abstract format:** Poster

Archeology multiplies the power of its methods when it has social utility and recovers collective memory.

This poster presents the action of the archeological group De la Roca al Metal (From Rock to Metal), in order to connect the people of the present with the past in a real way, lived and not only through texts, museums and documentaries to which they are accustomed.

We do this by:

- Useful archeology: Expanding meanings and applications given to archeology to introduce it in spaces where it can solve real problems.
- Popular education: There is no archeology without socialization and it does not exist without putting people ahead. We open space for participation in the creation of knowledge from archeology.
- Archaeological rescues: the goup offer technical advice for the study and care of the material legacies of the past against systematized destruction.
- Struggle against rural depopulation: we admire the knowledge of life in the countryside, the struggle and collaboration for its maintenance as a fundamental framework of knowledge.
- Transdisciplinary research: we are a school, always in the process of formation. We are open to dialogue with all kinds of

- people and specialists.
- Collective Memory Recovery: The commitment to the territories and the archeological methodology invites us to go out to meet the lost knowledge rescued in the legacy of the past.

183 IDEAS ACROSS TIMES. CULTURAL INTERACTIONS IN THE CENTRAL-WESTERN MEDITERRANEAN SEA FROM VII CENTURY BCE TO THE LATE ROMAN AGE

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Del Vais, Carla - Giuman, Marco - Parodo, Ciro - De Luca, Gianna (University of Cagliari) - Frère, Dominique (Université de Bretagne Sud)

**Format:** Regular session

Contemporary society daily compares with communications' and interactions' problems among different cultures and peoples. In this regard, the study of the dynamics of reception of ideas and objects, acquired in different contexts other than those in which they have been developed and produced, could be very interesting. Although according to different historical perspectives, the ancient world has tackled similar issues. Particularly, from the VII century BCE to the Late Roman Age, Mediterranean Sea becomes the setting of encounters and clashes, like commercial exchanges and wars, among the Phoenicians, Punics, Etruscans, Romans and the other societies that came into contacts with them. For example, in the central-western Mediterranean Sea in which these cultural systems settled, it is possible to analyze one of the most important issue of the so-called "archeology of interactions", that is how foreign artistic languages and system of values, material culture and technological knowledge have been transmitted and received by the native populations. This research session intends to propose a study of the archaeological data through which it is possible to identify the constitutive elements of the cultural phenomena just described. Therefore, from a methodological point of view, the aim of the session is to analyze, in a comparative way, the connections between use and function of material culture. More specifically, it intends to investigate the mechanisms of reception and perception through which the objects, in their dual role of material goods and cultural indicators, including for example foods and cosmetics substances traded, communicate ideas and images.

ABSTRACTS

1 MEDITERRANEAN EXOTICA AND THE FABRIC OF EARLY IRON AGE SOCIETY IN WESTERN IBERIA (7TH – 5TH CENTURIES B.C.E.)

**Abstract author(s):** Gomes, Francisco (University of Lisbon)

**Abstract format:** Oral

While the presence of exotic objects and raw materials is well attested in Western Iberia throughout the prehistoric period and also, very clearly, during the final phases of the Bronze Age, the arrival of Phoenician merchants and colonists and the ensuing integration of this area in wide-ranging Mediterranean-scale trade networks marks a clear watershed regarding the quantity and diversity of exotic imports which made their way to the Iberian Far West.

This change, however, should not be taken as just an expression of an increased access to transregional trade networks. On the contrary, the trade and consumption of exotica, including perfumes, adornment elements of glass, stone and faïence and amulets, among others, seems to have been a key component in the development of economic and political ties between western Phoenicians and local communities, and especially in the social development of the latter.

Mediterranean exotica, seen locally as luxurious prestige goods, were instrumental both in maintaining and enhancing a logic of social competition between elite groups inherited from the previous period, and in enabling new and creative forms to express individual and collective identities in a context of rapid change and transformation.

By deploying a contextual approach focused on consumption rather than trade, this contribution aims to explore the uses of Mediterranean exotica and the ways in which they became embedded in the social practices and strategies of local communities. In order to do so, a short contextual overview of the documented exotica will be offered. This will allow both for an analysis of their social role and for a discussion of possible new avenues of inquiry regarding their significance for the reconstruction of local perceptions of gender and embodiment.

2 WHEN ROME COMES, PAINT AS THE ROMANS DO. MEANING, SPREADING AND INFLUENCE OF ROMAN CONQUEST ON IBERIAN PAINTED POTTERY

**Abstract author(s):** Martínez-Boix, José Luis (Universitat d'Alacant)

**Abstract format:** Oral

In Contestania area, classical name given by ancient authors to the south-eastern zone of Iberian Peninsula, appears in the first half of 1st century BC a new painted pottery style, known by authors as "Ilicitan I Style". This decorated pottery style fills ceramic forms with back-looking wolves, birds showing off their wings, some anthropic figures and rich vegetal patterns. Traditionally, this style has been associated with the truly last expression of local identity, being latest Iberian artistic manifestation of unity before the romanization process begins. Nevertheless, recent researches have pointed at the fact that these evidences were found in sites

who seem involved in Sertorian War and Caesar's Civil War in this zone of Hispania, places where roman army and people were in contact with local communities.

In this sense, after these wars we see how these sites where decorated pottery is present become into colonia or municipium. Furthermore, these settlements were joined together by Via Augusta, giving us an idea of how important they were to guarantee the success of roman provincial politics and regional loyalty. Attending this, we explore the possibility of this iconographical expression being the product of a mixture between Iberian pottery tradition and new roman economical, political and cultural influences, who drive the local expression to new horizons being inspired by foreign presence. In this way, this Iberian painted pottery stablish an interesting case to study how material culture is affected by interactions, communications, wars and political conquests and how Iberian culture faces its dissolution into a new society. Our study addresses its reading through archaeology and iconography, attending to stratigraphy of the settlements where this pottery appeared, analysing patterns, compositions and graphic transmissions between cultures.

3 FROM MEDITERRANEAN TO CELTIC PRACTICES OF ALCOHOLIC CONSUMPTION: THE CASE OF THE ETRUSCAN CALDRON OF THE PRINCELY GRAVE OF LAVAU

**Abstract author(s):** Frere, Dominique (Université Bretagne Sud) - Barbier-Pain, Delphine - Dubuis, Bastien (INRAP) - Garnier, Nicolas (LNG) - Dodinet, Elisabeth (Université Bretagne Sud)

**Abstract format:** Oral

A princely tomb excavated 6 years ago in the East of France (Aube), revealed the skeleton of the "prince of Lavau". Lying at the centre of the tomb, the young man had been laid to rest inside an ornate two-wheeled chariot with a golden torque around his neck. In the northeast side of the grave, a beautiful bronze Etruscan caldron, masterpiece of a remarkable exposure of Mediterranean imported vessels, revealed a thick organic substance on its internal walls. We decided to apply an integrated approach (combined organic chemistry and palynology) for the knowledge of this substance which was deemed to be the testimony of the alcoholic beverage served during the funerary banquet. We obtained (1) biochemical evidences of red wine, Conifer pitch and beeswax, (2) a low number of pollen grains from lime (*Tilia* sp.) and a high concentration of pollen of the Lamiaceae (the family of Mint, Lemon balm, Lavender...). Based on these results, we can offer suggestions concerning the fermented beverage of the caldron: it contains a typical Mediterranean drink (flavoured wine) and not a Celtic beverage like mead. This is a red resinated wine with two possibilities: (1) the resinated wine is flavoured by a honey comb and possibly local aromatic plants, (2) the resinated wine is flavoured and sweetened by honey comb and honey rich in Lamiaceae pollens.

4 A MEDITERRANEAN ORIGIN OF GALLO-ROMAN BABY BOTTLES, MEDICAL CARE AND FUNERAL RITES ?

**Abstract author(s):** Jaeggi, Sandra (HISOMA, Lumière, Lyon 2; TEMOS Temps, Monde, Sociétés, Université de Bretagne-Sud) - Garnier, Nicolas (LNG; Chercheur associé AOROC CNRS UMR 8546) - Moliner, Manuel (Pôle Archéologie, Ville de Marseille)

**Abstract format:** Oral

The so-called feeding-bottles are known all around the Mediterranean, at least since the end of the second millennium BC. In Greece, the small beaker vase has been found in many tombs of classical times, especially children's tombs, a fact which intrigued the first archaeologists. This vase was later adopted by some cities in Sicily, such as Himera, by other cities in the Italian peninsula, and further west, in the necropolis of Marseille. In the 5th century BCE, the beaked vase seems to be at its peak and is found in different shapes: the beak is more or less long, wide or thin, the belly is globular or flat, the handle is lateral or at the top, and the mouth is sometimes equipped with a kind of strainer, which suggests multiple uses. The use of these vases and their initial function is debated. The results of analyses of the contents of about forty Gallo-Roman specimens discovered mainly in tombs of immature persons, suggest a therapeutic function, which raises questions about their role and meaning in a funerary context. Did the Marseilles beaker vases, predating the Gallo-Roman vases, inspire the Celts who were then "romanized"? Or should we consider that the transmission took place through another civilization, Roman or even Punic, since a gap of four centuries separates the bottles from the Greek necropolis of Marseilles (Sainte-Barbe) and the « romanization » of Gaul ? Analyses of the contents of Marseille feeding-bottles, combined with those of shellfishes found associated to the bottles in the tombs, could provide answers to this question and highlight an intercultural transmission - over the long term - not only of the form of this particular object, which probably had a use in everyday life, but also of a more symbolic role in the funerary context.

5 THE "SEVEN AGAINST THEBES" IN THE ETRUSCAN CINERARY URNS: MODELS OF ASSIMILATION AND TRANSFORMATION OF A GREEK MYTH

**Abstract author(s):** Giuman, Marco (University of Cagliari)

**Abstract format:** Oral

In the mechanisms of cultural interaction, the transmission of myths is an element of particular complexity, implying processes of transfer, selection and assimilation which, depending on multiple social, political and economic factors, are often difficult to frame in a correct exegetical perspective. In addition to this, it is evident that the feature of a myth, in which variability comes to represent a constant factor, further complicates the hermeneutic framework, often making it difficult to read, both in the diachronical and functional sense. A good example of this can be represented by the reception of the myth of the Seven against Thebes in the Etruscan culture: not particularly recurrent in the iconographic repertoires of the Greek world, instead the saga of the feud between

the Oedipus’ sons acquires great fortune in the Etruscan world, where we can also see a progressive detachment from the Hellenic prototypes in favour of iconographic keys that characterize in an increasingly local sense the transcription in image of the episodes of this saga. The aim of this contribution, which will take its cue from the analysis of the Etruscan cinerary urns preserved in the National Archaeological Museum of Perugia, will be to analyse this progressive transformation process, attempting to identify the nature of the dynamics that transform the saga of the Seven against Thebes into a major mythical theme in the funerary iconography of the Hellenistic Etruscan world.

6 **THE ORGANIC CONTENT OF THE BRONZE VASES OF THE HEROON OF PAESTUM: NEW DATA FOR A NEW INTERPRETATION**

**Abstract author(s):** Dodinet, Elisabeth (University of Southern Brittany - UBS - TEMOS) - Garnier, Nicolas (Laboratoire Nicolas Garnier) - Barbier-Pain, Delphine (INRAP - Université de Bretagne Sud - UBS, Laboratoire Géosciences Océan UMR-CNRS 6538) - Marinval, Philippe (CNRS - ASM - Archéologie des Sociétés Méditerranéennes)

**Abstract format:** Oral

The famous hypogaeum of the Greek city of Poseidonia (Paestum), excavated in 1954 and dated from the end of the VIth c. BCE, has been interpreted as a heroon based on the archaeological material retrieved. It encompassed 5 iron rods (obeloi) wrapped in a thick wool cloth, deposited on a wood table (trapeza) in the centre, of 8 bronze vases (6 hydria; 2 amphoras) and of an Attic amphora with black figures, set along the north and south walls of the structure. The walls and the bottom of the bronze hydria and amphora revealed a thick and paste-like yellow-brown organic substance. Many researchers still interpret this substance as honey or the remains of honeycombs, which would have been offered as part of a heroic cult to the founder of the city. Yet, the different sets of analyses performed during the 1950s and 1980s, although they could not identify the nature of the fatty substance, had allowed to reject the honey hypothesis. New analyses took place recently within a research program led by the Jean Berard Centre in Napoli. The pollen and GC-MS analyses have brought concordant data. The chemical analyses did not reveal any wax or animal fat, nor oleo-resin or plant pitch, but rather the markers of a siccative oil. The extracted pollen was dominantly that of Cannabaceae (eg. Cannabis (hemp) or Humulus (hop) (C/H)), the two plants being characterised by morphologically similar pollen. The interpretation of these intriguing findings will be discussed.

7 **THE CULTURAL ASPECTS OF THE CONSUMPTION OF BEVERAGES AND FOOD IN MONT’E PRAMA (SARDINIA - ITALY): WHICH INTERACTION?**

**Abstract author(s):** Frere, Dominique - del Mastro, Barbara (Université Bretagne Sud) - Usai, Alessandro (Soprintendenza Archeologia, Belle Arti e Paesaggio per la città metropolitana di Cagliari e le province di Oristano e Sud Sardegna) - Garnier, Nicolas (Laboratoire Nicolas Garnier)

**Abstract format:** Oral

Mont’e Prama, famous for its monumental necropolis with stone statues representing warriors and athletes, is an archaeological site located on the West coast of Sardinia (Italy): an island which has been for several millennia a strategic stop and privileged place for commercial and cultural exchanges in the center of the western Mediterranean basin. Twenty-one ceramics have been selected for organic residue analysis, coming from four tombs belonging to Mont’e Prama’s necropolis and other ones found on the occupation floor corresponding to the Nuragic phase of a subcircular building, named “B”, built on the western side of Mont’e Prama’s necropolis and next to a much larger building “A” which was probably used for ceremonial meetings. The purpose of this research aims to determine the organic substances used during the deposition ceremonies of the deceased from the final Bronze Age to the Iron Age. The presence of an Egyptian scaraboid seal from the tomb 25 awakes the possibility of introducing customs of foreign cultures. Moreover, the comparison between the contents of the ceramic sets issued from the tombs and that from the building B, which is located at 30 m in direction West from the necropolis, will afford better understanding the function of such a structure: was the building B a place where food and beverages were prepared for the funerary ceremonial and/or ritual meetings that could take place in the adjacent building A? This data joined with the chemical results can reinforce the strict connection between the building B and the necropolis life?

8 **HARBOUR SITES AS A SUPPORT TO THE RECONSTRUCTION OF NETWORKS AND INFLUENCES: THE CASE OF THE MISTRAS LAGOON (SARDINIA, ITALY)**

**Abstract author(s):** Mureddu, Maria (Università degli Studi di Cagliari) - Solinas, Francesco (The International Research Institute for Archaeology And Ethnology - IRIAE)

**Abstract format:** Oral

The sites where ancient harbours and anchorages were located are valuable contexts to investigate the different material culture that could reach a region, and to reconstruct ancient commerce and connections between different areas. Moreover, as they usually present waterlogged and anoxic sedimentation conditions, organic materials are preserved in addition to ceramics and other inorganic objects, giving more elements to the archaeological reconstruction.

This is the case of the Mistras lagoon in Central-West Sardinia. The lagoon has been identified as the harbour of the city of Tharros during the Phoenician and Punic period. It is characterised by an interior sandy barrier, recognised as a palaeobeach; here the University of Cagliari held two archaeological excavations during the years 2014 and 2015, revealing a rich material deposition, typical

of a harbour site.

The great number and variety of ceramics reflect the importance of local productions and the cultural influences, but also the varied supplies that arrived to Tharros, coming from other Phoenician and Punic areas and from different cultural regions. The analysis of the carpological remains, as seeds and fruits, reveal the presence of a great number of cultivated species; at least a part of them is probably what remains of ships cargo. Some of the species identified were possibly introduced during that period to the Island, together with agricultural practices and technologies that improved the local cultivation of plants already exploited during previous times. Finally, between the xylological remains found in the excavations, some fragments of manufactured wood testify the presence of ships built using the naval architecture originally typical of Phoenician and Punic regions and areas of influence.

9 **GREEK AND ETRUSCAN POTTERY IN PUNIC FUNERARY CONTEXTS OF THARROS: OBSERVATIONS ON THE REPERTOIRE AND USE**

**Abstract author(s):** Del Vais, Carla (Università di Cagliari)

**Abstract format:** Oral

Greek pottery appears in the funerary contexts of the necropolises of Tharros from the end of the 7th century to the end of the 4th cent. BC; Etruscan pottery is present only in the Archaic period (7-6 cent. BC). In this period the ceramics attested are Etruscan-Corinthian cups and aryballoi, Ionic cups and Etruscan bucchero; these vases seem to have a specific function in the context of the funeral ritual and they seem related to the ritual consumption of wine.

Since the end of the 6th century, however, the only documented Greek ceramic is of Attic origin, mainly black glazed; the shapes are more numerous, but the open forms and the lamps prevail; they belong to a well-defined morphological repertoire, common in the Punic Mediterranean area and probably selected by Carthage. In this case it is difficult to understand if they had a specific function within the funeral punic ritual or if they are only valuable funeral offers.

When the Attic productions disappear in the Western Mediterranean at the end of the 4th century BC, they are replaced by imitation pottery that reproduces the same shapes and probably has the same function.

The overall analysis of Tharros materials showed similar associations, but not entirely corresponding, to those of the other Sardinian and more generally Mediterranean necropolises. The main question is to understand if the imported vessels simply replace Punic ones in the context of a specific funeral ritual, or if they have a particular meaning, of a ritual or cultural type, linked to their allogeneic origin.

10 **GREEK MANUFACTS IN THE PUNIC TOMBS OF TUVIXEDDU (CAGLIARI)**

**Abstract author(s):** Collu, Michela (Univerità degli Studi di Cagliari)

**Abstract format:** Oral

The investigation of the funerary contexts of the Punic-Roman necropolis of Tuvixeddu (Cagliari), performed since the Nineteenth century, has led to the discovery, inside the tombs of the Punic Age, of Attic imported ceramics and other manufactures in which formal and iconographic features of strong Hellenic dependence have been recognized. Despite the difficulty, in most cases, of being able to attribute to the individual tombs their respective funeral kits, it was nevertheless possible to identify the most recurrent ceramic forms and, starting from specific artefacts, to distinguish the status, culture and habits of the individuals to whom they belonged. Of fundamental importance, in this regard, was the report of the 1908 excavations of A. Taramelli at the Predio Ibba, in which are reported the lists of materials recovered in each of the more than 150 hypogea investigated, accompanied by drawings and photographs, as well as the most recent contributions published by D. Salvi on the necropolis of Cagliari.

In order to understand whether the presence of these materials in the Punic funerary contexts was connected to a precise ritual and cultural value or if they were simply valuable objects deposited in the tombs for their value, the data published have been integrated with the preliminary results of the archive research completed within the study and research activities part of the General Agreement signed in June 2016 between the Department of History, Cultural Heritage and Territory of the University of Cagliari and the Superintendence ABAP for the metropolitan city of Cagliari and the provinces of Oristano and South Sardinia.

11 **ICONIC STELAE AND CIPPI IN ROMAN SARDINIA: ONE MORE CASE OF CULTURAL HYBRIDIZATION**

**Abstract author(s):** Angiolillo, Simonetta (University of Cagliari)

**Abstract format:** Oral

In different sites of Sardinia many funerary monuments of the Roman period of a peculiar type have been found; most of all are stelae, but there are also cippi, urns and baetyli. All of them are made in local stone and are decorated with a very schematic and basic image of the deceased: usually there is only the head, rarely a whole-length figure. In some cases there is also the depiction of some object through which the dead may be recognized, in other cases an inscription in Latin reminds his (or more rarely her) name and age.

We will try to identify the cultural milieu where these monuments were created and to understand who their customers were, people who chose a monument which mixed ideological elements of plain Roman origin and an artistic language completely unrelated to the Roman tradition. So we will analyse the geographic diffusion of these monuments with reference to the historical events of the Sardinian areas where they were found and we will look for similar works in the whole Italian territory and in the Mediterranean lands.



SIGNS OF ROMANIZATION AND AUGUSTAN PROPAGANDA IN THE RURAL AREA OF SULCIS IN SARDINIA: THE CASE OF SU LANDIRI DURCI

**Abstract author(s):** De Luca, Gianna (Università di Cagliari)

**Abstract format:** Oral

Between 2005 and 2008, an excavation carried out in the industrial area of Carbonia in the Sulcis region of Sardinia, allowed to bring to light a settlement of the Punic-Roman age, near to the important acropolis of Monte Sirai. The subsequent excavation campaigns highlighted an interesting planimetric articulation of the site, interested by different life stages that can be framed between the 3rd cent. B.C. and 2nd A.D. One of the most consistent period can be placed between the end of the 2nd cent. B.C. and the beginning of the 1st cent. A.D, when close to the Augustan age a modiolus in Italic Sigillata from the Pisan workshop of M. Perennio appear, as the only example of this class of materials. The vase, preserved for about half of the whole, shows a relief figurative decoration that can be interpreted as closely linked to August propaganda messages, which therefore make it an object that denotes a high social status. The manufacture of the vase seems to be able to take place in the years immediately following the battle of Azio and its presence in Sardinia is therefore particularly indicative also for political and economic considerations. These facts propose interesting questions about the commercial dynamics through which the modiolus came to Carbonia and about its use and function. This contribution aims to identify possible interpretative lines that highlight the connections between the archaeological fact, i.e. the discovery of M. Perennio’s modiolus and its historical and iconographic interpretation in relation to the complex mechanisms of Romanization of the Sulcis territory, suitably evaluated at light of considerations also of a commercial nature.

THE ARCHAEOLOGY OF DEATH IN SARDINIA IN THE ROMAN AGE: TRACING CULTURAL INTERACTIONS IN A PROVINCIAL CONTEXT

**Abstract author(s):** Parodo, Ciro (University of Cagliari)

**Abstract format:** Oral

This research focuses on the analysis of the funerary practices and contexts in Sardinia (Italy) in the Roman Age. In the study of the historical relationships among the ideology and rituals concerning the dimension of death, and the social and political transformations in Sardinia during the transition from the Punic domination to the Roman one, the meaning of the funerary evidence is related to the interactions between the previous Punic cultural tradition and the new ideological patterns coming from Rome. Indeed, the persistence of the Punic tradition is demonstrated by the iconic funerary stelae found in the area surrounding Sassari (northern Sardinia), created following the schematic Punic images of the deceased, or by the so-called Sa Presoneda mausoleum in Sant’Antioco (southern Sardinia), comparable with some Punic funerary tower monuments. Concerning the Roman cultural tradition, more specifically the presence of the members of the Italic middle class is very influential in the island, as confirmed by the funerary monument with Doric frieze found in Cagliari (southern Sardinia), belonging to a Hellenistic class of monuments which is widespread in Central Italy. At the same time, it is very important the presence of provincial cultural patterns, as demonstrated particularly in Cagliari by the “a cupa” graves, a type of funerary monument which reproduces the looks of a real barrel, derived from popular models in Africa and Spain, the regions which Sardinia is very close to for its iconographic choices and funerary customs. Starting from these examples, the study of the funerary archaeology is useful to examine the phenomenon of “Romanisation”, as a process of construction of transcultural social systems. The aim of this research is to investigate how these different cultural aspects of the archeology of death interact with each other in Sardinia from the late Republican Age to the Imperial one.

MULTI-PERIOD LAND-USE IN CENTRAL SICILY 13TH CENTURY BC TO 13TH CENTURY AD

**Abstract author(s):** Hummler, Madeleine (University of York) - Molinari, Alessandra (University of Rome Tor Vergata) - Spatafora, Francesca - Vassallo, Stefano (Soprintendenza archeologica Palermo)

**Abstract format:** Oral

Recent archaeological investigations by the ERC-funded SicTransit project\* (2014–2019), continuing earlier research in the province of Palermo and central-western Sicily (e.g. Vassallo 2007, Spatafora 2016), have documented changing land-use in the interior region of Castronovo di Sicilia (PA). Geophysics, surface collection, drone survey, and sample excavations show a fluctuating sequence of lowland and upland occupation in the later second and first millennia BC (with highlights in the Bronze Age and Archaic periods), repeated in the first and early second millennia AD (Roman, Byzantine, Islamic, Norman and Swabian periods).

Snapshots of this occupation include a settlement on a terrace of the river Platani (Bronze Age), a votive deposit and settlement on the high-altitude site of Monte Kassar (Archaic period), a rural site and villa at San Luca (fifth century BC to Byzantine period), multiperiod occupation on the crossroads site of Casale San Pietro (Roman to Swabian), and occupation of the Byzantine fortress on Monte Kassar and present-day Castronovo, including the castle at San Vitale (Norman period onwards).

This example from Sicily’s multifaceted history, reflected in phases of expansion and contraction, resilience and opening to new material culture at a nodal point between Agrigento and Palermo will, we hope, contribute to the discussion on dynamics of interaction that the organisers of the session “Cultural Interactions in the Central-Western Mediterranean Sea” wish to address and how this translates on the ground.

\*especially also by Martin Carver, Gabriele Ciccone, Francesca Colangeli, Fabio Giovannini, James Lyall and Antonino Meo.

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ACCUMULATIVE INTERACTION AND SOCIAL TRANSFORMATION IN IRON AGE AND ARCHAIC WESTERN SICILY

**Abstract author(s):** Balco, William (University of North GeorgiaDepartment of History, Anthropology, and Philosophy)

**Abstract format:** Oral

Late Iron Age and Archaic western Sicily was a nexus of social interaction, entangling indigenous Elymian populations with foreign merchants and colonists from Greece, the Levant, Etruria, and elsewhere. This interaction accumulated over time, growing from sporadic contact to sustained economic, social, and in some cases biological entanglement. Such complex social entanglement introduced new ideas and material culture to the extant western Sicilian populations. The reception and re-imagination of these ideas and objects is best exemplified among commensal feasting vessels. Here, western Sicilians incorporated foreign vessels alongside their own feasting assemblages, transforming their visual display of wealth, power, and prestige. Local responses to these foreign commensal vessels attest to the transformation of socially constructed power structures, demonstrating the creation of new identity expressions incorporating stylistic elements borrowed from foreign cultures. Consequently, this paper explores methods to study the transformation of status displays among feasting vessels from domestic and mortuary contexts in western Sicily.

RECEPTION OF IDEAS AND IMAGES FROM THE OUTSIDE IN THE MALTESE PHOENICIAN-PUNIC POTTERY FROM TAS SILĠ

**Abstract author(s):** Saponara, Antonella (Independent Researcher) - Semeraro, Grazia (University of Salento)

**Abstract format:** Oral

The paper aims to provide an overview of the production of vessel forms originated by prototypes coming from outside of the Archipelago.

The more recent studies about this presence in the archaeological record show that in all the Phoenician sites in Central and Western Mediterranean area there are originals, imitations, and adaptation of ceramic forms different from the local production. The phenomenon in the Maltese pottery production is present, but less direct, above all in connection with the introduction of the typical characters of Greek ceramics; considering the current state of research, the real imitations of Greek pottery are missing in the archaeological data from Malta, unlike other Phoenician-Punic sites in the Mediterranean Sea (e.g. the black glazed cups). This peculiarity is analyzed through the data coming from the research of a huge account of the pottery from a dump context in Sanctuary of Astarte in Tas Silġ, dated between the second half of VIII c. BC and the end of II c. BC; the wide chronological arc allows examining in a diachronic way the reception and elaboration of ideas and images in the local manufacturing process and lifestyle.

THE LOCAL GODS. THE CULT OF THE THREE NYMPHS IN THRACE

**Abstract author(s):** Avramova, Mariya (Antiquity of Southeastern Europe Research Centre, University of Warsaw)

**Abstract format:** Oral

Religion is one of the most specific elements in the culture of any group of people. As a result, the study of religious beliefs makes it possible to study changes in a given cultural entity. This paper concentrates on the case study of the cult of the Three nymphs in ancient Thrace. The cult was quite popular in Roman times and is attested by numerous finds of votive tablets. They reveal a developed iconographical scheme and the surviving inscriptions point to a unified naming convention. However, the votive tablets have no analog in Thracian material from the pre-Roman period. Did the cult appear in Roman times? Was it introduced by the Romans or did the interaction with Roman culture trigger the development and popularization of an already existing cult? The author will try to answer those questions by comparing the available information regarding the Thracian cult and the role of the nymphs in the Roman pantheon.

RELIGIOUS AND CULTURAL INTERACTIONS IN ANCIENT LIGURIA AND CORSE (IRON AGE AND ROMAN PERIOD): NATIVE HERITAGE AND OUTSIDE DEVOTION INTAKES

**Abstract author(s):** Piccardi, Eliana (Independent researcher)

**Abstract format:** Poster

Investigating the religious landscape in ancient Liguria and ancient Corsica allows us a quite good point of observation upon a series of interesting dynamics, emerging like a diachronic mosaic resulting both from different and scattered hints of possible natives’ devotion heritages and outside religious intakes.

About the first aspect there is the objective difficulty to gather enough and coherent witnesses compared to other ‘more structured’ areas from the 1st millennium BC onwards: ancient Liguria and Corsica are, in fact, both longtime strongholds of native identities and external civilizations crossroads; nevertheless, evidence about local devotions are weak and scattered.

By starting from this datum we’ll try to verify some mechanisms of interaction or reaction among the religious imagery and the related forms of devotion carried on by the natives here, and the external intakes. Here, differently from the next areas of the Southern

Gaule, the contact with the more structured religions like the Greek one doesn't come out into forms of 'strong' syncretism – e.g. with well defined sacred areas – as well as, for instance, in the Greek-Gaulish sanctuaries documented in the next Maritime Alps area.

Also the potential religious consistence of the allogenic presences like Greeks and Etruscans (after all, well documented as trading partners whenever not as inhabited enclaves like at Genoa or at Aleria) it is usually perceived as feeble and often through indirect evidence; some hints may also come from the funerary rituals and assemblages, as well as in the pre-roman necropolis of the same sites.

Therefore, here, a prevalent juxtaposition appear, among the feeble Iron Age elements and the outside coming more structured religious elements: how far as this may be or not a hint of lack of permeation among the different human elements settled here, at least until the overwhelming Romanization.

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MORPHOLOGICAL DIVERSITY IN ARCHAEOLOGY. DATA EXPLORATION AND VISUALIZATION BY GEOMETRIC MORPHOMETRICS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Csippán, Péter (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Borel, Antony (Histoire Naturelle de l'Homme Préhistorique - HNHP, Muséum national d'histoire naturelle, CNRS, UPVD, Paris; Eötvös Loránd University, Institute of Archaeological Sciences, Budapest)

**Format:** Regular session

Form (shape + size) is a key feature of all archaeological artefacts or ecofacts. For few decades, new methods have been developed in order to quantitatively describe shape variations. In geometric morphometric, shapes are defined as points configurations. The exploration and visualization of these configurations allow investigating the relationships between shapes and external factors (e.g. sites, cultural and environmental context, etc.). As a fusion of biology and geometry, GM was formerly dedicated to deal with biological and paleontological issues. Since, GM has been largely applied in other fields such as archaeology and it became a powerful tool to understand, for example, evolutionary path, goods exchange, know-how sharing, artefacts functions etc.

This session aims at gathering papers and/or posters dealing with form, either focusing on methodological aspects/development of morphometric analysis involving points configurations or focusing on archaeological interpretations. We are open to complete or incomplete research and/or research at a basic step facing methodological issues that could be discussed within the session.

ABSTRACTS

1

SHAPING THE BLADES: THE POTENTIAL OF APPLICATION OF ELLIPTIC FOURIER ANALYSIS TO PRISMATIC BLADES

**Abstract author(s):** Radinovic, Mihailo (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Kajtez, Irina (Faculty of Geography, University of Belgrade)

**Abstract format:** Oral

Despite the appearance of novel approaches to lithic studies, most analyses are still of qualitative nature. Qualitative studies are of great importance for the study of lithics, but their main downsides are the lack of standardization in the choice of analyzed attributes and their modalities, as well as the existence of inter-researcher variability. Furthermore, it is difficult to describe complex shapes of knapped stone tools using descriptive terms and subjective typologies, even when coupled with linear measurements and indices. These issues are especially hampering appropriate large-scale comparisons of results from different studies, which could contribute to the study of wider cultural dynamics. In this paper, we use quantitative methodology to assess the shape of prismatic blades. For this purpose, we applied Elliptic Fourier Analysis (EFA) in order to compare the outlines of experimentally produced prismatic blades, and we also conducted a case study to illustrate the utility of this approach. We show how this method, which is repeatable, time-efficient and facilitates large-scale comparisons, can contribute to the study of lithic technology, as well as other aspects of prehistoric societies.

2

2D AND 3D GEOMETRIC-MORPHOMETRIC ANALYSES OF STONE AND COPPER AXES FROM THE 5TH MILLENNIUM BC SOUTH-EASTERN EUROPE

**Abstract author(s):** Milic, Marina (University College Dublin) - Bogosavljevic-Petrovic, Vera (National Museum Belgrade) - Sands, Rob (University College Dublin)

**Abstract format:** Oral

This paper explores the role of the earliest copper tools in the transformation of social practices, in the heart of stone-using Neolithic communities in the Balkan Peninsula in the 5th millennium BC. While the adoption of metallurgy has been widely explored, the consumption and craft practices of first copper object have less often been evaluated. Our study focuses on copper axes, the earliest metal objects that were produced following the initial invention of metallurgy. The examination of material, shape and functionality of axes helps us better understand a) typological and morphological variations of early copper axes and b) the relationships

between the earliest copper axes their stone counterparts (skeuomorphism). The basis of our study is a digital comparative analysis of copper and stone axes found within Vinča culture sites in Serbia (5th millennium BC). We also include observations on contemporary assemblages from neighbouring regions.

Using developments in 3D digital modelling and geometric-morphometric analyses, this paper aims to provide a new digital and statistical approach to the study of typological and technological characteristics of axes. Our methods include examination of shape variations using 2D (principal component analyses) and 3D geometric-morphometric analyses on a number of contemporary copper and stone axes. The 2D and 3D geometric-morphometric analyses allow comparative and objective shape analyses. The overall outcome of the study will provide improved understanding of social practices surrounding the consumption of new materials and technologies and, ultimately, how this relates to economic, prestige and symbolic processes enabling the complex transformations of the transitional later Neolithic / Chalcolithic period.

3

PHYLETIC SERIATION OF EXPERIMENTALLY PRODUCED ANTHROPOMORPHIC FIGURINES: AN EXERCISE IN MORPHOMETRIC ANALYSIS

**Abstract author(s):** Radinovic, Mihailo (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Porčić, Marko (Department of Archaeology, Faculty of Philosophy, University of Belgrade; Biosense Institute, University of Novi Sad)

**Abstract format:** Oral

In order to investigate aspects of cultural transmission in the laboratory, we conducted transmission chain experiments with anthropomorphic clay figurines. Forty participants, both novices and experts, were grouped into four chains, and their task was to copy the figurine from the previous generation as best as they can. The first participant in each chain was presented with a model of figurine made of polymer clay with an instruction to reproduce it as well as she/he could using the same material. Then the figurine made by the first participant was used as a model for the second participant and so on until generation 10. Thus, four distinct lineages of figurines were produced, and our experiments showed the effect of accumulated copying errors on figurine appearance over generations. In this study, we explore the possibility of reconstructing the correct sequence of their making using phyletic seriation. With this goal in mind, we applied different approaches to describe their shape, and then observed the patterns of variability using multivariate statistics. Besides the frequently used attribute analysis, we applied geometric 2D landmark-based approach and Elliptic Fourier Analysis of outlines in order to record their variability. Despite numerous studies on anthropomorphic clay figurines, their appearance is seldom assessed and compared in quantitative manner, and this study will explore the advantages and disadvantages of different approaches for conducting phyletic seriation, and assessing similarities and dissimilarities in figurine shape.

4

POTTERY TYPOLOGIES, REPRESENTATION AND MORPHOMETRICS

**Abstract author(s):** Cantisani, Matteo (Institut für Archäologische Wissenschaften, Bochum)

**Abstract format:** Oral

This paper discusses morphometric approaches to classification of prehistoric painted pottery and their potential in archaeological practice-oriented studies. Archaeological investigations have long benefited from classificatory tools, e.g. in space-time systematics, and filling lists of types still endures even in practice-oriented studies and most recent approaches to the materiality of the human past. As a matter of fact, understandings of artefact variability that build upon taxonomies and representativeness have been demoted, while sensorial engagements with archaeological datasets often become the focus of sustained scholarly examinations that privilege experience and practices over meaning, chronology and context. Instead, this paper argues that a theoretical understanding of experience and practice in archaeological discourses can also come from an “unorthodox” analysis of variability in archaeological datasets through a morphometric approach to pottery classification. For this purpose, a case study from Early Bronze Age Sicily (2300-1600 BC) is presented which shows how quantifying shape and size is addressed in order to use variability as a proxy to explore social boundaries. Eventually, I will discuss the implications of this study in acknowledging morphometric approaches to variability in pottery datasets as resilient strategies, in order to explore what social scenarios and embedded practices might have been.

5

DIFFERENTIATION OF GRAVE UNITS BASED ON CALCULATING CERAMIC VESSEL VOLUMES FROM PROVINCIAL NECROPOLIS II OF ANCIENT GERULATA

**Abstract author(s):** Szabová, Alina - Porubčanová, Zuzana (Department of Archaeology and Museology, Masaryk University)

**Abstract format:** Oral

The ceramic vessels from necropolis No. II were redocumented within the ongoing revision of archaeological material from necropolises belonging to the roman military castel with civil background. It is the best researched one and has the highest informative value not only through archaeological, but also anthropological material. Therefore for the purposes of this study was chosen a collection of vessels from that particular site, which consists of approximately 120 artifacts of various shapes. In a spectrum of funerary rite forms dominate simple inhumation and cremation pit graves, but brick tombs and others are present as well. Vessels served mainly as offerings and part of them was used as urns. Drawing and photo-documentation was applied for creating 3D models of individual artifacts. Vessel visualisations were a data source for the quantitative measurement of its volume variations. Models and volume calculations were created in open source software Blender. Based on obtained information a correlation between vessel volumes and graves in which it was found, was observed. Subject of this research is identification of potential structural coherence of variables



in question (such as age, sex or affiliation within social hierarchy) by using statistical analyses.

## 6 MORPHOMETRY OF ROMAN MILITARY BRICK STAMPS: FUTURE OF THE STAMP CLASSIFICATION?

**Abstract author(s):** Janek, Tomáš (Institute of Classical archaeology, Charles university, Prague)

**Abstract format:** Oral

Research of building ceramics has a great importance for understanding the Roman building activity. Roman forts and civil buildings can provide a large amount of building material. The material needs to be classified and dated, which is in many cases possible only with the stamp analysis. However, the current classification is mostly based on epigraphy, which is not accurate and creates too many stamp types. Fortunately, majority of dies used for stamping were made of wood, making every die unique. That means if two stamps were made by the same die, they should have same dimensions, even if some parts are abraded and not readable. The comparison of those dimensions might be more effective in classification than standard approaches.

In order to classify the stamps accurately, it was necessary to develop a new comparison system. The system was derived from morphometric analyses and involves computer application. Data are extracted from the vertical photos of stamps and subsequently mathematically compared. Comparative criteria were developed specifically for the Roman stamped brick material. The system can be applied on both completely preserved stamps and on fragments. In the case of complete stamps, the focus is on the dimensions of the edge. In case of fragments, the comparison system is more complicated and takes into consideration proportions and position of every preserved letter. The advantage of this system is, that three preserved letters are enough to reconstruct the rest of the stamp. The presented case study involves analyses of material from Mušov-Burgstall and ancient Vindobona (Vienna). The results show that current typological sorting can be incorrect. In fact, stamps separated into several types by traditional methods proved to come from one die.

## 7 DENTAL MORPHOLOGICAL ANALYSIS OF NEOLITHIC TO IRON AGE POPULATIONS FROM THE GREAT HUNGARIAN PLAIN. A GEOMETRIC MORPHOMETRICS APPROACH

**Abstract author(s):** Gamarra, Beatriz (Catalan Institute of Human Paleoecology and Social Evolution - IPHES, Tarragona; University of Rovira and Virgili, Tarragona; School of Archaeology and Earth Institute, University College Dublin) - McCall, Ashley (School of Archaeology and Earth Institute, University College Dublin) - Del Bove, Antonietta (Catalan Institute of Human Paleoecology and Social Evolution - IPHES, Tarragona; University of Rovira and Virgili, Tarragona) - Koós, Judit - Csengeri, Piroska (Department of Archaeology, Herman Ottó Museum, Miskolc) - Kalli, András (Várkapitányság Nonprofit Co.) - Domboróczki, László (István Dobó Castle Museum, Eger) - Anders, Alexandra (Institute of Archaeological Sciences, Eötvös Loránd University, Budapest) - Feeney, Robin N.M. (School of Medicine, University College Dublin) - Pinhasi, Ron (Department of Evolutionary Anthropology, University of Vienna)

**Abstract format:** Oral

The transition to farming was among the most significant events in human history that drove major biological and cultural change globally. For its situation in central Europe the Great Hungarian Plain (GHP) was the meeting point of Eastern and Western European cultures. Moreover, this was an area of high population influx and admixture during European Prehistory.

Paleogenomic studies provide evidence of clear genomic shifts that coincide with the advent of the Bronze and Iron Ages, in accordance with large-scale migrations and replacements. Further bioanthropological studies of these populations are needed to understand the biological and cultural impacts of the adoption of agriculture.

Teeth constitute the skeletal evidence most widely used in paleoanthropology research for interpreting the biology of species, including humans. Dental tissues do not remodel following mineralization and teeth are genetically conserved. Accordingly, their morphological structure is less affected by environmental factors compared to bone. Thus, teeth serve as a valuable permanent record for discerning morphological and genetic population variability, together with establishing biological relationships and affinities between human groups as well as migration and adaptive patterns.

Here we apply a 3D geometric morphometrics approach to explore dental morphological affinities of the GHP populations from the Neolithic to Iron Age. Specifically, the enamel-dentine junction of maxillary first molars, obtained from micro-CT scans were used as a genetic proxy, and their morphological variability was examined among the samples. Preliminary results suggest that dental morphological variability did not dramatically change during the 5000 years. Overall, the variability was mostly explained by differences in cervical form among individuals from different periods. Further analyses are needed to explore the role of dental morphology and the implications they have on population dynamics during Prehistory in the GHP.

This research was supported by H2020-MSCA-IF 2015 (703373) and the Hungarian Research, Development and Innovation Office (FK128013).

## 8 THE ROOT CAUSE: UNDERSTANDING CHANGES IN TOOTH ROOT SHAPE OVER THE PAST 1,500 YEARS IN BRITAIN

**Abstract author(s):** Fernee, Christianne (University of Bristol; University of Southampton) - Robson Brown, Kate (University of Bristol) - Zakrzewski, Sonia - Dickinson, Alex (University of Southampton)

**Abstract format:** Oral

As the interface between the tooth and skull, the tooth root plays a pivotal role in tooth function, yet quantitative analysis of root shape is lacking in current archaeological research. Geometric Morphometrics is being increasingly used in archaeological and anthropological research to quantitatively analyse shape. However, issues arise when using traditional Geometric Morphometric methods on material, such as tooth roots, that lack of definable landmarks. This paper aims to investigate variation in root shape, using a 'new' automated Geometric Morphometric method, over the past 1,500 years in Southern Britain.

Teeth were obtained from archaeological, early (n=100), mid (n=100) and late-Medieval (n=100), and modern (n=66) samples. They were micro-CT scanned using a Skyscan 1272/1275 and a Nikon XTH 320, at a resolution of 17.5–65  $\mu$  m. Root surfaces were isolated, from which linear and volumetric measurements were obtained and surface shape was quantified. Root shape and allometry were then analysed for variation between populations and individuals.

The results suggest that root shape and allometry are both biologically and eco-sensitive. The causes of these changes will be discussed in relation environmental, both selective and plastic, and genetic factors. The benefits and future potential of the technique used, which is yet to be applied widely to archaeological samples, will also be considered. The repercussions of this research will also be discussed.

9 SORTING THE KANGAROOS FROM THE WALLABIES: USING GEOMETRIC MORPHOMETRICS TO DISCRIMINATE BETWEEN MACROPODIDAE POST CRANIA

**Abstract author(s):** Mein, Erin (University of Queensland)

**Abstract format:** Oral

Geometric morphometrics has been used in European zooarchaeology for several decades yet has received little attention by Australian archaeologists. Zooarchaeology in Australia faces several distinct methodological challenges, some of which may be approached through the application of geometric morphometric techniques to our unique marsupial fauna. People have occupied Australia for 65,000 years, interacting with a unique and highly diverse marsupial faunal community, yet almost no work has been undertaken to clarify how we discriminate between taxa from Australian archaeological sites. Most identifications are undertaken using teeth but very little is understood about the morphological variation of the marsupial post cranial skeleton. Remains of kangaroos and wallabies (Macropodidae) are the most common taxa reported in prehistoric Australian archaeological sites. A highly diverse family with 40 extant species, macropods occupy a wide variety of habitats from dense rainforest to arid plains. Without robust identification protocols Australian zooarchaeologists are limited to vague taxonomic identifications such as 'small macropod' that tell us little about past human ecological adaptations. In the same way that archaeologists have long been challenged by the difficulties of discriminating between morphologically similar species such as goats and sheep, the interpretative power of Australian zooarchaeological data is currently hampered by our inability to discriminate between macropod species. This paper, drawn from my PhD research, presents a discussion of the application of geometric morphometrics to macropod post crania and results of initial attempts to develop quantitative methods of discriminating between these taxa. While this study is the first of its kind in Australia, it draws upon a well-established global morphometric tradition.

## 10 TYPOLOGY AND MORPHOMETRY OF ARROWHEADS FROM THE LATE BRONZE AGE TO THE EARLY IRON AGE IN THE NORTH-EASTERN IBERIAN PENINSULA

**Abstract author(s):** Fernandez Molina, Gerard (SERP (Seminari d'Estudis i Recerques Prehistòriques) - López-Cachero, F. Javier - Zamora Hinojosa, Tamar (SERP - Seminari d'Estudis i Recerques Prehistòriques)

**Abstract format:** Oral

This proposal to a poster points out the typological and morphometric analysis of a significant sample of metallic arrowheads gathered in the north-eastern Iberian Peninsula, dating back to the Late Bronze Age and the Early Iron Age.

The first bronze arrowheads identified in this territory are already related to the Early Bronze Age. The metallic specimens of this period imitate the shapes available on the contemporary's lithic arrowheads, characterized by the presence of a central tang into the base of the body used as a handle system. Although different typologies have been identified during this period, the formal features of these arrowheads do not seem to show huge variations.

However, within the Late Bronze Age, different typologies of arrowheads, with particular morphological features, emerged to the scene, showing the taxa diversification. Even though most arrowheads are characterized by the continuity of the tang handle system, during the Late Bronze Age, a series of formal changes appear, such as the enlargement or the widening of the upper part of the stem.

Within the transition to the Early Iron Age, the first examples of arrowheads with a socket handle system appear, despite the fact that this system will not be fully discernible until the 6th century BC.



a. Thus, the main aim of this project is to provide a typological classification for the metallic arrowheads of the Late Bronze Age – Early Iron Age of the north-eastern Iberian Peninsula, based on their metrical and morphological diversity. For this reason, a morphometric method will be used with the willingness of creating reference groups in order to analyse their formal evolution linked to the dynamics of consumption of these objects.

**DENTAL MORPHOMETRIC MODELS, EXPRESSION OF SEXUAL DIMORPHISM IN A HUMAN GROUP FROM ANCIENT IAȘI CITY (ROMANIA)**

**Abstract author(s):** Popovici, Mariana (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research) - Petraru, Ozana-Maria (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research; Faculty of Biology, “Alexandru Ioan Cuza” University of Iași) - Groza, Vasilica-Monica (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research) - Bejenaru, Luminița (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research; Faculty of Biology, “Alexandru Ioan Cuza” University of Iași)

**Abstract format:** Poster

Teeth are generally very well-preserved human remains discovered in archaeological excavations, due it to hard tissues in their composition. Therefore, teeth are used as material in various paleoanthropological approaches, including sexual dimorphism (SD) analysis. Although the SD has been intensively studied on the molar size, the patterns of SD on the molar shape is not yet a topic addressed at the same scale. Exploring the size and shape of molar together gives a much more complete quantification of sexual dimorphism, because these two components are correlate. The most advantageous method of the size and shape analysis is the Geometric morphometrics (GM), method adopted in the present research.

Our research evaluates the size and shape variability of 69 upper second molars of 17th century from Iași (Romania). The quantitative data were collected using a set of landmarks located on the occlusal surface, at groove intersections, and a set of semilandmarks traced on the periphery of the same surface.

Our results indicate that the size appear to be a poor indicator for SD, contrary to the shape which additionally provides a high degree of discriminant role. The features of the female molars are defined by a shorter buccolingual diameter and a broad of mesiodistal diameter, leading a slightly rounded shape of the molar. The patterns of male molars are characterized by compressed mesiodistal and increasing buccolingual diameter, acquiring an approximately oval shape. Discriminant analysis shows molar shape patterns in the both sexes defined by functions between different regions of the second molar and the orbital index. The comparative analysis with molar samples from prehistoric sites reveals similarities in the dental morphometric models.

This work was supported by a research grant made with financial support from the Recurring Donor Fund, available to the Romanian Academy and managed by the “PATRIMONIU” Foundation GAR-UM-2019-II-2.1-16.

b. **ATTEMPS AND PROBLEMS OF THE EMPLOYMENT OF GEOMETRIC MORPHOMETRICS IN THE ATTRIBUTION OF LATE ARCHAIC ATTIC VASES**

**Abstract author(s):** Johácz, Szilvia (Eötvös Loránd University, Budapest)

**Abstract format:** Poster

In the Late Archaic - Early Classic period the Attic ceramic market was covered by large quantities of low-quality (black)-figured pottery. Not only in Athens, but even in the whole Ancient Mediterranean these mass-produced vessels emerge constantly, even from modern excavations. Therefore, in contrast to most vases of more talented painters they can be attached to an archaeological feature or layer. Due to their inadequate style, relatively few characteristics can be determined while looking at the painting. Thus, the manufacturing criteria, such as the details of the shapes, are more important in the attribution. In this poster, I am asking if it is possible to study greek vases with the help of geometric morphometrics using 3D reconstructions, and what kind of problems am I facing during the research? Given that these are man-made, diverse objects, which have a lot of flaws and malformations, moreover, the majority had been broken over time then restored, their form is even further compromised, posing a problem source for morphologic research.

**194 IN TEXTILE LAYERS. WRAPPED HUMAN REMAINS, ANIMALS AND ARTEFACTS IN THE NILE VALLEY FROM PREHISTORY TO THE EARLY MEDIEVAL PERIOD. PART 1**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Yvanez, Elsa (Centre for Textile Research, University of Copenhagen) - Brandt, Luise (The GLOBE Institute, University of Copenhagen) - Borla, Matilde (Soprintendenza Archeologia, Belle Arti e Paesaggio per la città Metropolitana di Torino)

**Format:** Regular session

This session aims to design a methodological approach to the study of wrapped remains and artefacts from the Nile Valley. “Wrapping” here encompasses textile bandages, shrouds and clothing that wound, bound or enveloped humans and animals as part of funerary treatments and textiles used to ritually cover grave goods and dress divine figures. Throughout the long history of ancient Egypt, funerary wrapping was used to an even industrial scale, which led to the development of dedicated embalming workshops, diverse material sourcing channels, specialised skill sets, and commercial markets. An unparalleled amount of wrapping materials have survived and is today kept in European museums, as well as in numerous cultural institutions in Egypt, Sudan, and worldwide.

Despite the ubiquity and historical potential of this practice, wrapping and wrapped remains have not been the focus of specific scholarly research.

Through the all-encompassing approach of textile wrappings, we will reveal the network of interconnected crafts and processes necessary to manufacture them and turn them into economically, ritually and epistemologically powerful artifacts. We will add layers to our knowledge of textiles, raw material supply and recycling channels, wrapping techniques, as well as their development through time and their religious functions and ritual purposes across contexts.

We hope to bring together researchers from universities and museums, with varying and interdisciplinary approaches spanning from egyptology, philology, archaeology, history, and conservation, to physical anthropology, forensic and biomolecular sciences, and imaging technologies. The main outcome of the session will be a new, interdisciplinary network, dedicated to cross-institutional collaborations and innovative interpretations. Our joint discussions will result in a landmark publication merging detailed case studies at the fore-front of current research with a newly defined methodological model.

**ABSTRACTS**

**1 THE MUMMY IN THE DRESS: A CASE STUDY**

**Abstract author(s):** Fiore Marochetti, Elisa (Soprintendenza Archeologia Belle Arti e Paesaggio della città Metropolitana di Torino) - Oliva, Cinzia (Oliva restauro tessuti) - Boano, Rosa (Università degli Studi di Torino, Dipartimento di Scienze della Vita e Biologia dei Sistemi)

**Abstract format:** Oral

Presentation of the rare funeral deposition of a young adult female mummy dated to 2407-2199 BC. This was found in the northern cemetery of Gebelein during the campaign of the Italian Archaeological Mission in Egypt in 1920. The mummy is lying on the left side and the body has been first wrapped in bandages and then inserted inside a pleated tunic. On the body and head they laid two different shrouds, one of which partly pleated.

The head rests on a linen-covered headrest. The condition of the textiles was very poor, due to both age and long display. There was a general lack of strength and elasticity in the fibres which were fragile, very brittle and partly covered by dust. The mummy

undergone a conservation treatment, which freed the fibres from dust and helped the study and repositioning of dislocated textile fragments. Discussion on the use of robes in funerary rituals during the Old Kingdom.

**2 ADOPTION OF LOCAL TEXTILE CUSTOMS? TEXTILES IN THE NUBIAN C-GROUP CEMETERY AT HIERAKONPOLIS (EGYPT) DURING THE MIDDLE KINGDOM**

**Abstract author(s):** Dickey, Alistair (The University of Liverpool)

**Abstract format:** Oral

With the completion of the Aswan High Dam in 1970, much evidence of a vibrant culture that once existed in ancient Lower Nubia disappeared beneath the waters of Lake Nasser. Prior to the opening of the dam, archaeological operations in the 1960s attempted to salvage the maximum amount of culture and information concerning the C-Group culture (c. 2400-1550 B.C.), but inevitably gaps remained.

Initially discovered in 2001 and excavated over the course of 4 seasons, the C-Group cemetery at Hierakonpolis is only the second such cemetery to be found in Egypt, the most northerly C-Group cemetery anywhere and possibly the only one extant. The scarcity of such evidence makes this cemetery highly valuable in adding to our understanding of this Lower Nubian culture.

For a culture traditionally associated with leather usage for garments rather than textiles, surprisingly 20 out of the 64 tombs contained textile remains, thus providing a unique opportunity to undertake –for the first time – an in-depth examination of textiles used by the C-Group. This paper will discuss in-field methodology and analysis of the textile remains carried out in 2018, shedding light on textile technology (e.g. splicing, weave construction) and evidence of how the textiles were being used by the C-Group in the burial context. The unique Hierakonpolis collection also affords the opportunity to offer insights into how these textiles compare or contrast with contemporary evidence found elsewhere in Egypt and Nubia.

**3 WRAPPING THE ELITE: THE MUMMIFICATION TEXTILE DEPOSIT OF THE VIZIER IPI AT DEIR EL-BAHARI (THEBES, EGYPT, CA. 2000 BCE)**

**Abstract author(s):** Ortiz García, Jónatan - Morales, Antonio J. (Universidad de Alcalá)

**Abstract format:** Oral

Textiles used in the ancient Egyptian process of mummification were considered sacred materials to be safeguarded in a space nearby the final resting place of the dead. Within the framework of the Middle Kingdom Theban Project –University of Alcalá– archaeologists working on the courtyard of the tomb of Ipi (TT 315) have relocated 56 jars filled where embalmers and priests deposited the unclean equipment, bandages, oils, and salts used in the process of embalming and wrapping the dead. The identification of these materials is of great importance for understanding techniques used in the early Middle Kingdom process of mummifying high officials.

The deposit of the mummification materials used for Ipi included sixty-seven jars with pot marks and other types of inscriptions, various shrouds and linen sheets, shawls, and rolls of wide bandages, in addition to further types of cloths, rags, and pieces of slender wrappings destined to cover fingers, toes, and other parts of the vizier's corpse. Furthermore, the deposit also contained around 300 sacks with natron salt, oils, sand, and other substances, as well as the textile stoppers of the jars and a scraper. Among the most outstanding pieces of the collection are various large bandages, a shroud, a fringed shawl, natron bags that were deposited in the inner parts of the vizier's body, twisted bandages used as mummy packing, and small pieces of bandages for the upper and lower extremities.

The collection of materials provides an excellent opportunity for the scientific analysis of the textile repertory found in the embalming cachette, as well as the technical procedures and religious acts implied in the mummification of a high-official in the early Middle Kingdom. The significance of the assemblage also derives from the fact that all textiles originated from the same ultimate action: the embalming of the vizier's corpse.

## CLOTHING USED AS WRAPPING MATERIAL IN BURIALS FROM THE NECROPOLIS OF FAG EL-GAMOUS (1ST MILLENNIUM AD)

**Abstract author(s):** Kwaspen, Anne (CTR - SAXO - UCPH) - South, Kristin (Brigham Young University)

**Abstract format:** Oral

The necropolis of Fag el-Gamous, just past the eastern rim of the Fayoum Oasis, has produced hundreds of well-preserved burials during the forty years of its ongoing excavations. Dating from the Late Roman, Byzantine, and early Medieval periods, wrapping techniques for these burials consist mostly of sheets of undyed linen folded around the body. Of those burials with sufficiently preserved textiles to observe, approximately 5% have contained clothing fragments as part of the burial ensemble. Of this small number, only 10% were found to have been worn by the deceased while the remainder were used as wrapping materials in the style of a shroud.

This paper summarizes the typical uses of rectangular sheets of linen and then presents a more detailed overview of the different ways clothing was used as a burial material at this site, which was in continual use throughout the first two-thirds of the 1st millennium AD. From garments as burial gifts used as wrapping, to completely worn-out tunics used in face bundles or other stuffing material, we review the secondary uses of clothing as wrappings. We also include a technical description of the special conservation techniques necessary to fully understanding the finds when their ancient usage leaves them hardened into layers.

## ARE THIRD INTERMEDIATE PERIOD CARTONNAGES ONLY CHEAP SUBSTITUTES FOR WOODEN COFFINS? PRELIMINARY RESULTS ON TEXTILE LAYERS USED FOR COFFINS

**Abstract author(s):** Hunkeler, Charlotte (University of Basel)

**Abstract format:** Oral

In the early 22nd Dynasty, there was a sudden change from the so-called yellow coffin ensembles manufactured completely in wood to sets with cartonnage cases as inner coffins. Cooney's research on the yellow coffins has shown that a high percentage of them were reused (e.g. K. Cooney 2017, "Coffin Reuse. Ritual Materialism in the Context of Scarcity" and K. Cooney 2018, "Coffin Reuse in Dynasty 21: A Case Study of the Coffins in the British Museum"). Some scholars argue thus that the cartonnage cases were introduced due to the limited wood resources, for a better protection of the deceased, and because of their cheap and fast production (e.g., A. Niwiński 1988, "Sarkophage, Stelen und Grabpapyri der Dritten Zwischenzeit und der Spätzeit" and Taylor 1988, "The Development of Cartonnage Cases").

To manufacture cartonnage cases several textile layers were wrapped around a temporary Nile silt core and glued together with animal glue. Still in a moist state, the cartonnage case was opened on the rear, the temporary core was removed, and the deceased was pushed inside. The opening was sealed and several layers of paste were applied on the outside. Then the cartonnage case was decorated. Although cartonnage cases as such were only in use until the early 25th Dynasty, inner wooden coffins of the 25th and 26th Dynasties continue to be sealed by a textile layer before being decorated.

For my PhD thesis the manufacture of inner coffins dating to the transitional phase of the 22nd to the 25th Dynasties plays a key element. In the following paper I would like to outline the individual sequences of the cartonnage production and to show that the order of these manufacturing steps indicate a more complex tradition in using textile layers than simple cost- and time reducing arguments.

## RE-SHROUDING THE PAST: RECONTEXTUALIZATION OF MUMMY SHROUDS FROM GRAECO-ROMAN EGYPT WITH DIGITAL 3D MODELING

**Abstract author(s):** Faas-Bush, Susanna (University of California, Berkeley)

**Abstract format:** Oral

Valued for their naturalistic portraiture, painted mummy shrouds from Graeco-Roman Egypt were often stripped from their mummies and displayed in collections as two-dimensional pieces of art. These artifacts are still stored and displayed while flattened and framed, in part due to their fragile state. This decontextualization distances scholars and casual viewers from their role as funerary wrappings and hinders understanding of their intended function and experienced effect.

This paper documents my work to recontextualize these shrouds through digital re-wrapping using 3D modeling software. The creation of digital models from high-resolution photography causes no damage to the artifacts while allowing the consideration of different wrapping techniques and their effects on the visibility of different parts of the shroud. It also permits the hypothetical reconstruction of the bandages that would have bound the shroud to the mummy.

I will present my methods in digital reconstruction using Autodesk Maya and Blender, as well as some case studies where re-wrapped models illuminate how the shrouds' decoration hinges on their three-dimensionality, ranging from organization and orientation to complex visual play. These models work to refocus attention on the ancient process of wrapping remains and the shrouds' charged role at the time of burial, rather than the invasive modern unwrapping that has left them so flat.

## WRAPPING THE DEAD IN MEROITIC SUDAN: A FIRST OVERVIEW

**Abstract author(s):** Yvanez, Elsa (University of Copenhagen)

**Abstract format:** Oral

Thanks to an arid climate, Sudan and Nubia have proved to be a very fertile ground for textile research. Since the beginning of the archaeological exploration along the Middle Nile valley, hundreds of well-preserved fabrics have been discovered, for the most part in funerary contexts. It is especially true for the Meroitic (c. 350 BCE – 350 CE) and Postmeroitic (c. 350 – 550 CE) cemeteries excavated during the 1960s' UNESCO Nubian campaign, which has provided exceptionally rich textile collections curated today in museums across the world. A small number of scholarly works has since exploited this rich documentation, mostly in the form of specialized textile catalogues and reports. However, a large body of archaeological archives and publications has also been assembled during and after excavation, offering the rare chance to re-examine the textiles in connection with their context of use in the grave.

Recent studies and ongoing excavations have moreover deepened our understanding of Meroitic funerary practices. Covering a very vast territory, the Meroitic royalty brought under its unifying authority a myriad of different population groups. Despite the widespread attestation of Meroitic funerary traditions, local differences in grave types, body positions, and material assemblages point towards a certain diversity of mortuary practices.

Drawing from in situ textile finds in graves, this paper will present a first overview of the different gestures that accompanied the wrapping of bodies in the Meroitic kingdom. Overarching funerary archaeology and textile research, it will propose a method to incorporate archives, textile studies, and modern archaeological practices to trace these fleeting but very meaningful gestures.

## A BIFOCAL APPROACH OF THE HUMAN AND ANIMAL MUMMIES FROM EL-DEIR, KHARGA OASIS, IN THE WESTERN EGYPTIAN DESERT

**Abstract author(s):** Letellier-Willemin, Fleur (CRIHAM EA 4270 University of Limoges; Archaeological Mission of El Deir, Kharga Oasis, Western Egyptian Desert)

**Abstract format:** Oral

A methodological approach has been developed from the textiles of human mummies which were discovered inside five cemeteries on the site of El Deir. This site, which was occupied between the end of 6th century BC till 5-6th centuries AD, is located in the Kharga Oasis. By studying funerary textiles on the field, in connection with other studies performed by the excavating team, we can carry out our investigations on two areas. The first goal is a better understanding of the part played by textiles amongst religious practices, their economic status, their social context. The second one is to precise their development and changes on a unique site, El Deir, for a long, complicated period, from Persian, Greek and Roman times, till Christianity settled in. Moreover, excavating cemeteries at El Deir, we were lucky to discover hundreds of dogs' mummies dated Ptolemaic and Roman periods. We developed a specific study of their textile wrappings and, at the same time, a comparative study with the wrappings of human mummies on the site. This comparative study is extended now to the textiles of the dogs' mummies of the Musée des Confluences, at Lyon, which has in its possession a huge collection of animal mummies coming from the Nile Valley, mostly dated Graeco-Roman period.

## THE ECONOMIC AND RELIGIOUS ROLE OF WRAPPING OF ANIMAL MUMMIES IN ANCIENT EGYPT – A CASESTUDY FROM SAQQARA

**Abstract author(s):** Brandt, Luise (GLOBE Institute)

**Abstract format:** Oral

Several large catacombs for animal cults have been uncovered throughout Egypt. Recently, the Catacombs of Anubis at North Saqqara has been investigated and estimated to have held up to between 7 and 8 million animal mummies of primarily dogs and cats. These mummies could have been deposited over just a few hundreds of years or even less, which would indicate a large scale production of animal mummies for donation every year. This paper focuses on the wrappings of these mummies to clarify their economic and ritual role in the animal cult.

Through a CT-scanning of a cat-mummy and a following calculation of the linen consumption for the mummy, the paper argues that the animal cults must have required a large and continuous supply of linen for mummification. Linen was costly and the preliminary morphological analysis of the bandages suggest that the mummies were wrapped in recycled cloth. The recycling channels for the large amount of linen used at the enbalming workshops are discussed as well the linens value with regards to concealing and reshaping the interior as well as its deprecating and transitional powers.

AN ATTEMPT TO TRACE THE ROLE OF WRAPPING FIGURINES PLACED INTO TOMBS IN THE CONTEXT OF RELIGIOUS TEXTS

**Abstract author(s):** Kasprzycka, Katarzyna (University of Warsaw)

**Abstract format:** Oral

The custom of wrapping figurines which were placed into the tombs by the ancient Egyptians is attested since at least the Middle Kingdom period and up to at least the New Kingdom period in archaeological sources.

In this last period, the wrappings of the figurines sometimes reflect the costumes known from iconography, but sometimes they are simply fragments of textiles thrown onto the figurine.

To try to understand, at least partially, the phenomenon of wrapping figurines placed in tombs, one should refer to religious texts such as the Opening of the Mouth Ritual, or the Book of the Dead itself, because precisely these texts shine a little light on the role of textiles in the beliefs of the ancient Egyptians attributing magical properties to wrappers that allow both - figurines and the deceased - to revive and to wander safely in the afterlife. All these elements seem to indicate a very significant role of the wrappings in the beliefs of ancient Egyptians.

IN TEXTILE LAYERS. WRAPPED HUMAN REMAINS, ANIMALS AND ARTEFACTS IN THE NILE VALLEY FROM PREHISTORY TO THE EARLY MEDIEVAL PERIOD

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Brandt, Luise (The GLOBE Institute, University of Copenhagen) - Yvanez, Elsa (Centre for Textile Research, University of Copenhagen) - Borla, Matilde (Soprintendenza Archeologia, Belle Arti e Paesaggio per la città Metropolitana di Torino)

**Format:** Regular session

This session aims to design a methodological approach to the study of wrapped remains and artefacts from the Nile Valley. “Wrapping” here encompasses textile bandages, shrouds and clothing that wound, bound or enveloped humans and animals as part of funerary treatments and textiles used to ritually cover grave goods and dress divine figures. Throughout the long history of ancient Egypt, funerary wrapping was used to an even industrial scale, which led to the development of dedicated embalming workshops, diverse material sourcing channels, specialised skill sets, and commercial markets. An unparalleled amount of wrapping materials have survived and is today kept in European museums, as well as in numerous cultural institutions in Egypt, Sudan, and worldwide. Despite the ubiquity and historical potential of this practice, wrapping and wrapped remains have not been the focus of specific scholarly research.

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ABSTRACTS

EATING THE DEAD – INSECT FAUNAS FROM EGYPTIAN MUMMIES

**Abstract author(s):** PanagiotaKopulu, Eva (School of GeoSciences, University of Edinburgh)

**Abstract format:** Oral

The study of mummies tends to concentrate on the bodies of humans or animals, as there are few other instances where body tissue is preserved from archaeological contexts. The research rarely considers what mummification was employed to put a stop to, decay and decomposition, and in particular the part played in this process by colonisation of the decaying body by various insects, largely Coleoptera and larval Diptera capable of processing hair, flesh and to a certain extent bone. In theory, insects should have been excised during the mummification process through the use of wax, natron and other organic substances, although blowflies will oviposit on a body shortly after death and there is a well-researched sequence of invaders thereafter. The study of faunas from Egyptian mummies points to unique forensic assemblages and showcases the potential of this research. Wrapping and rewrapping subsequent to the primary burial or even during the last three centuries may contribute to any post mortem faunas, as the example of the insects associated with the mummy of Ramses the Great has demonstrated. In terms of palaeoecological research, insects from mummies led to some of the first studies in palaeoentomology during the nineteenth century. Recently material from mummies has provided secure AMS dates from insect chitin. In terms of insect faunas, the well studied Manchester Museum mummy 1770, which was rewrapped probably during the Roman period, has substantial faunas, heavily dominated by the cheese skipper, Piophilidae casei, whose vernacular name indicates another preferred habitat. This is the earliest record of an insect also responsible

TOWARDS AN INTEGRATED APPROACH RELYING ON CHARACTERISATION AND RADIOCARBON DATING FOR THE STUDY OF TEXTILES FROM ANCIENT EGYPT

**Abstract author(s):** Ferrant, Marie (Sorbonne Université, CNRS, laboratoire MONARIS - UMR 8233, Paris; Institut Français d’Archéologie Orientale - IFAO, pôle archéométrie, Le Caire) - Bellot-Gurlet, Ludovic (Sorbonne Université, CNRS, laboratoire MONARIS - UMR 8233, Paris) - Quiles, Anita (Institut Français d’Archéologie Orientale - IFAO, pôle archéométrie, Le Caire)

**Abstract format:** Oral

This research projects aims at developing a new approach combining characterisation and radiocarbon dating of Egyptian textiles, diachronically and through the whole Egyptian territory, in order to integrate textile into groundbreaking chronologic designs. It also aims at refining current knowledge on the use of textiles in Egypt from the dynastic, Roman as well as Islamic periods.

Textiles can be abundantly found on excavation sites in Egypt, due to very arid conservation conditions and their study can yield major information about daily life during Ancient Egypt. Depending on their function, various organic substances can be found impregnated on the textile (waxes, oils, resins, pigments, bitumen...). Such substances can sometimes turn out to be “contamination” for radiocarbon dating and should be removed prior to dating. For example, bitumen, composed of fossil carbon, will cause systematic ageing of the sample whenever it is present.

This project relies on four main analytical steps:

- Non destructive analysis of the textile sample using vibrational spectroscopy (FTIR, Raman)
- Extraction of the organic substances identified as possible contamination
- Molecular characterisation of the organic substances (GC-MS)
- Radiocarbon dating of the “clean” textile

Thanks to a preliminary development on test samples, promising results have been obtained from textiles from on-going Egyptian excavation sites, especially from Luxor necropolis. We will see how organic substances can be identified and extracted from the textile and if the extractions tested allowed good radiocarbon accuracy or not. We will also discuss the importance of good conditions in the lab (artificial ageing, reference materials...) to understand the states of degradation encountered in real archaeological samples. Future works will also be detailed, such as new corpuses to study and new extraction methodologies to adapt to archaeological textiles.

THE MANY LAYERS OF THE ZAGREB MUMMY WRAPPINGS

**Abstract author(s):** Gleba, Margarita (Ludwig Maximilian University of Munich) - Whitehouse, Ruth (Institute of Archaeology, University College London) - Boudin, Mathieu (Royal Institute for Cultural Heritage - KIK-IRPA) - Deviese, Thibaut (School of Archaeology, University of Oxford) - Uranić, Igor (Archaeological Museum Zagreb)

**Abstract format:** Oral

The Zagreb mummy is famous for having had, among its wrappings, fragments of the only extant Etruscan linen book, liber linteus. The mummy was bought in Alexandria in 1848 and since 1867 both the mummy and the manuscript have been kept in the Archaeological Museum of Zagreb, Croatia. Based on the style of writing, several possible dates have been suggested for the linen book: the 3rd century BC, the 1st century BC, and the 1st century AD, so when in late 1980s the radiocarbon date came back as 360-210 BC, the 3rd century BC date was accepted. The structural analysis of the large number of other textiles associated with the mummy however have never been carried out to our knowledge, although some of them appear to have been radiocarbon dated at the same time as the linen book. The variation in fabric structure and quality and several textiles made in spliced yarn – a technique which supposedly disappeared in Egypt by 600 BC – suggested a spread in dating. The AMS radiocarbon dating of six of these fabrics has produced a very wide chronological spread, ranging over one thousand years. The question arose whether this mixture was introduced in antiquity through recycling of textiles for mummification, or in the 19th century – by the dealer who sold the mummy – both possible scenarios. It also brought into question the date of the linen book. The new AMS radiocarbon dating of the liber linteus has also produced unexpected results, indicating that previously dated samples may not have come from the linen book. The paper will present the results of the new multidisciplinary investigation of the Zagreb mummy wrappings and discuss the importance of dating textiles using both technological parameters and radiocarbon.

THE STORY OF THE “CAMISIA” FROM THE MUSEO EGIZIO OF TURIN: CONSERVATION TREATMENT AS AN ENHANCEMENT OF AN ARCHAEOLOGICAL TEXTILE

**Abstract author(s):** Bruscagin, Camilla (Roberta Genta; Matilde Borla; Anna Piccirillo)

**Abstract format:** Oral

This presentation focuses on the study of a three-dimensional archaeological cloth dated to 396-584 AD (14C) and belonging to the collection of the Museo Egizio in Turin. The cloth was acquired in 1901 by Ernesto Schiaparelli. The excavation context and provenance are unknown. This study was carried out in 2019 as part of a Master Thesis at the University of Turin’s Conservation and Restoration Centre “La Venaria Reale”.



5 The garment, currently inside out, is a simple cloth made of eight pieces of plain weave linen, sewn together. The neckline and cuffs have been embellished with tablet woven linen trimmings.

After conducting preliminary bibliographical research on the stylistic evolution of Late Antique fashion, it was possible to relate the garment to a Sasanian influence and identify the garment as ‘camisia’. In fact, the evidences led to the hypothesis that the ‘camisia’ represents an evolution of Late Antique fashion both for the introduction of Sassanid tailored models as well as for the development of technical manufacturing processes. Experimental recreation, such as the creation of paper models and the set up of a new loom for the tablet weaving, made it possible to gain a better understanding of the materials and techniques.

Unfortunately, during a previous invasive treatment, the original appearance of the ‘camisia’ was significantly altered when some fragments of clavus were glued onto both the sides in order to facilitate its sale in the antiques market.

The presence of adhesives and the weakness of the fibers required a methodological reflection on the conservation treatment, which was strictly focused on preserving the original material. The treatment carried out, sustained by an accurate diagnostic campaign, has made it possible to give structural stability to the fibers and to provide a correct understanding of the formal value of the “camisia”.

## 5 PAINTED SHROUDS FROM PTOLEMAIC TO ROMAN PERIOD. TWO CASE STUDIES FROM THE MUSEO EGIZIO OF TURIN

**Abstract author(s):** Buscaglia, Paola (Centro Conservazione e Restauro La Venaria Reale, Turin) - Borla, Matilde (Soprintendenza Archeologia Belle Arti e Paesaggio per la Città di Torino, Turin) - Genta, Roberta - Piccirillo, Anna (Centro Conservazione e Restauro La Venaria Reale, Turin) - Turina, Valentina (Museo Egizio, Turin)

**Abstract format:** Oral

On the occasion of new development of the visible storage space for human remains of the MuseoEgizio of Turin, the Centro Conservazione e Restauro La Venaria Reale was entrusted with the study and conservation of two mummies (C. 2223- C. 2245) with painted shrouds (still in place), chronologically attributable to the Ptolemaic and Roman period.

In this paper the authors will give a detailed description of wrapping techniques and of the painted shrouds, taking into account the context and focusing on common characteristics and on eventual changes in practise, besides giving account of which criticalities defined the priorities in conservation treatments and how an innovative approach influenced the choices in the intervention.

The two conservation treatments, carried out with a view to minimal intervention, to reversibility and to aesthetic features, were defined on the basis of the preservation issues that emerged from the analysis of the finds, with also innovative approaches in reference to current conservative practice.

Thanks both to the scientific insights linked to the materials characterization and to the macroscopic and microscopic observation, it was possible to detect specific technical characteristics and to hypothesize deterioration mechanisms strictly connected to the constituent materials and to the mummies conservative history.

## 6 RE-COMPOSITION OF LATE ANTIQUITY CLOTHS: THE RESTORATION TREATMENT AS A TOOLS FOR THE COMPREHENSION OF THEIR FORMAL AND FUNCTIONAL VALUES

**Abstract author(s):** Tricerri, Chiara - Cardinali, Michela - Genta, Roberta (Centro Conservazione e Restauro) - Borla, Matilde (Soprintendenza Archeologia Belle Arti e Paesaggio per la Città di Torino) - Turina, Valentina (Fondazione Museo Antichità Egizie)

**Abstract format:** Oral

The presentation is focused on the conservative treatment of seven large blue cloths (S. 17400, S. 17481, S. 17482, S. 17491, S. 17491/bis, S. 17491/ ter, S. 17492) that are part of the collection of the Museo Egizio di Torino, dated to 3rd-4th centuries AD.

When the cloths arrived to the conservation centre, they were made by numerous fragments (about 40), brought together without any particular care during an old conservative treatment. They are made with a tapestry weaving technique, mainly weft, and are made of yarns of vegetable and animal nature: linen for the warps and wool for the wefts. The intense blue of the background, of which the warps are also specially dyed, is enriched by bands and minute polychrome decorative motifs made using special technical expedients, such as separations, free weaves and curved weaves.

The fundamental support of an accurate campaign of scientific investigations, and in particular of microscopic observation of the textile surfaces and characterization of the restoration materials, were decisive in defining the operational phases of the intervention. The conservative restoration of the cloths focused on the disassembly of the fragments, the numbering and compilation of precise survey sheets, specific for archaeological textiles, aimed at collecting technical data on textile weaving (measurements, reduction, yarn count, weaving grain). Each pre-existing core has been formally broken down, analyzed individually and in relation to the other ones, and progressively repositioned according to principles of compatibility and formal coherence.

The delicate phases of final re-composition, finally saw the creation of six new formal units (S.17400 + S.17481; S.17481 + S.17491/ter; S.17482/a; S.17482/b; S.17492; S.17491 + S.17491/bis) that partially return their original formal and functional values.

## 7 STARTING FROM THE BACK: STUDIES, DIAGNOSTICS AND CONSERVATION TREATMENTS OF USAI’S MUMMY FACE DOWN

**Abstract author(s):** Oliva, Cinzia (Freelance Textile Conservator) - Picchi, Daniela (Museo Civico Archeologico – Bologna)

**Abstract format:** Oral

The mummy of Usai, son of Nekhet and Heriubastet (MCABo EG 1975) belongs to the Egyptian collection of the Archaeological Museum in Bologna.

Recently, it became necessary to clean and consolidate Usai’s wrappings. The results of the preliminary diagnostic investigations (radiocarbon dating, 3D Computed Tomography and optiual microscope fibres analyses) confirmed the mummy’s sex as male, dated the mummy between 821-740 BC, and provided useful information on previous treatments.

The mummy was in poor condition, partly due to the natural ageing of the bandages and mainly to the conservation treatment performed in the second half of the last century. Due to this, it was very difficult to pursue the study of textiles and proceed with the planned diagnostic test.

We decided to start the work on the back of the mummy, where the materials were free of any consolidation and contaminants. We proceeded with an innovative “turning upside down” of the mummy. We made a kind of frame and adapted an inflatable surgical mattress to our needs: the “turning” was easy, safe and economical.

Working from the back allowed a full view of the mummy, we have been able to study the textiles and proceed with the sampling for diagnostic. During the job we found that the shroud had a brocaded pattern, tucked under the feet. The conservation started with the cleaning operation and the consolidation of the back of the mummy with the insertion of shaped padding, to fill the gap left by the lost of material; to consolidate the mummy we wrapped it completely in a nylon net, dyed and sewn on itself. We then turned the mummy on the front and completed the operations on that side, with special care to head’s bandages.

## 8 HOW TO DRESS AN URN AND WHY? TEXTILES IN FUNERARY RITUALS IN IRON AGE CENTRAL EUROPE

**Abstract author(s):** Kohle, Maria (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts; Albert-Ludwigs-Universität Freiburg)

**Abstract format:** Oral

The fact that cremation was the dominant rite in Central Europe during the Late Bronze and the beginning of the Early Iron Age should not be seen as a disadvantage but as an opportunity for (textile) archaeology. Practice theoretical approaches can provide interesting insights into the role that textiles played in the complex funerary rituals.

Thanks to modern excavation techniques and accurate documentation, a versatile use of textiles in cremations of that period can be proven. Burnt textiles found between the cremated remains indicate that the corpse lying on the pyre was clothed or wrapped in a shroud. Unburned textiles found...

... in-between the cremated bones and the urn point to the lining of the vessel;

... in context of piled cremated bones hint to an organic cinerary container;

... on the outside of an urn suggest that it was wrapped.

The latter is particularly noteworthy, since jewellery and clothing accessories documented in the immediate vicinity of these urns indicate that the purpose was to dress the urns and thus give them a human appearance. Indeed, urn dressing is a widespread aspect of funerary rituals and an expression of anthropomorphisation - the increased occurrence of anthropomorphic representation -, which appears in various forms in Iron Age Central Europe (e. g. anthropomorphic urns or pendants, bronze or clay statuettes, life-sized human images). What we can learn from the phenomenon of anthropomorphisation regarding communities, their cult of death and ancestors is not easy to answer. Possibly the dressed urns show us the attempt to deal with death and transience and are therefore comparable - although different in their execution - with mummification. Instead of stopping the decay of the human body by conservation, it was controlled by destruction in the course of cremation, in order to create a new, imperishable shell afterwards.

## 9 AN EARLY 4TH MILLENNIUM FUNERARY KIT FROM THE SOUTHERN LEVANT

**Abstract author(s):** Levy, Janet (Ben Gurion University of the Negev)

**Abstract format:** Oral

A unique primary burial of a mature male was recovered from an undisturbed cave in Wadi Makkukh. The interred, wearing a wrap-around kilt and a sash, was lain within a four layered envelope-like linen shroud. 880 person-power days were invested in the shrouds manufacture. It was woven in plain weave on a horizontal-ground loom from spliced, s2S-yarn. It features a weft fringe, a pigmented selvedge cord and warp stripe and also weft bands at each end in pigmented yarn in basket and half-basket weave. The funerary bundle was lain on a twill reed mat. Next to the interred lay two leather sandals (not a pair), a flint blade, a coiled basket and a bow, deliberately broken in half with reed arrows and a heddle rod recycled as a walking stick. The entire assemblage was generously sprinkled with red ochre during the funerary rites.

Secondary burial in ceramic ossuaries was the primary mortuary mode of the Chalcolithic period. This burial, dated 3990-3700 BCE, may be representative of a hitherto un-found first stage of decarnization prior to reburial. Minimal osteological evidence of an earlier

burial was recovered from an inner niche, dated 4300 BCE, also with linen and mat fragments. In my reconstruction the interred was a paterfamilias of an extended family whose women folk had acquired considerable expertise in textile manufacture. It constitutes manufacture within households by kin, integrated into the agro- pastoral economy of the Ghassulian culture, and not in specialized workshops.

It is possible that the eponymous site of Teleilat Ghassul, ca. 12 km distant, after which the mid-5th millennium Ghassulian culture is named, was the in-life locus of the interred. The site features marshy conditions suitable for flax cultivation, a fresco featuring ritual specialists clad in woven gowns and the largest spindle whorl assemblage of the region.

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## NO MAN TRAVELS ALONE, HE TAKES HIMSELF ALONG: YAMNAYA TRANSMISSION AND/OR TRANSFORMATION DURING THE 3RD MILLENNIUM BC EUROPE

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Ahola, Marja - Preda-Bălănică, Bianca (University of Helsinki) - Włodarczak, Piotr (Polish Academy of Sciences - Instytut Archeologii i Etnologii Department) - Valchev, Todor (Regional Historical Museum - Yambol)

**Format:** Regular session

'It is now often said that the arrival of the steppe populations, the so-called Yamnaya, in south-eastern Europe at the end of the 4th/very beginning of the 3rd Millennium BC changed forever the continent. Current research, especially fuelled by recent aDNA studies, suggests large scale migrations took place and triggered irreversible processes of change in biological ancestry and culture. According to this research, the scenario seems clear: the Yamnaya came, conquered the locals and... their descendants created phenomena apparent in the archaeological record, of which the Corded Ware complex is the most prominent example. But, was it this simple? From an archaeological perspective, how this process of interaction and networking unfolded in the various regions of Europe is still blurry.'

This session aims to shift the focus from genetics to archaeology, and take a look at the material culture and ritual practices to explore how this transmission happened during the 3rd millennium BC. Since most of these phenomena are known especially through burial assemblages, our focal point will be in mortuary archaeology. However, instead of placing our gaze solely to the obvious – the tradition of a single grave under a barrow – we aim to dig deeper and investigate how the steppe ancestry translates in terms of religion, beliefs and ideology – and does it? For example general ideas about the transmission from Yamnaya to Corded Ware emphasise single graves under barrows while a variation of burial customs exists within the Corded Ware record.

Accordingly, we aim to explore the similarities and differences seen within the mortuary remains of the Yamnaya and subsequent archaeological complexes of the 3rd millennium BC. We welcome a broad spectrum of papers dealing with the material culture of death, body handling, sacred landscape, or papers that illustrate theoretical or methodological approaches to the study of interaction and transmission in 3rd millennium BC Europe.

## ABSTRACTS

1

### THE “DARK AGES” OF SOUTHEAST EUROPEAN PREHISTORY AND THE RISE OF THE YAMNAYA PHENOMENON

**Abstract author(s):** Nikitin, Alexey (Grand Valley State University) - Ivanova, Svetlana (Institute of Archaeology) - Lillie, Malcolm - Budd, Chelsea (Umea University)

**Abstract format:** Oral

The disintegration of the Balkan-Carpathian Metallurgical Province and the rise of Trypillian mega-settlements coincided with the onset of the atmospheric Bond 4 Event at ca. 3900 calBCE (the 5.9 kiloyear event). Bond 4 ushered in the end of the Atlantic Climatic Optimum and the collapse of agriculture-based economy in Europe. A dramatic economic, cultural, social and genetic shift took place in the steppe region north of the Caspian and Black Seas between around 3900 and 3300 calBCE, subsequently extending to all corners of Europe and beyond. This transformation was associated with, and, in all probability, carried by the people of the Yamna(ya) culture complex (YCC) and their relatives and descendants. The period leading up to the formation of YCC is an enigmatic time, a sort of “Dark Age”, in the prehistory of southeast Europe. This talk will attempt to shed some light on these prehistoric “Dark Ages”, presenting new and critically re-evaluating existing evidence, including C14/stable isotope and ancient DNA data, from the burial structures scattered throughout the North Pontic steppe and the surrounding areas within the “Dark Ages” time transect.

2

### THE EARLIEST BARROW GRAVES IN BULGARIAN LANDS

**Abstract author(s):** Alexandrov, Stefan (National Archaeological Institute with Museum - Bulgarian Academy of Sciences)

**Abstract format:** Oral

Not long ago grave complexes related to “Yamnaya” phenomenon were considered by the vast majority of the scholars to be the earliest barrow graves in the present day Bulgarian lands. Until the new millennium, the available 14C dates from such complexes were quite a few, placing the earliest such graves at the end of the 4th millennium BC. However, based on formal criteria such as body position, grave facilities and inventory etc., even than some of the barrow graves were argued as possibly earlier than “Yamnaya”

phenomenon.

Nowadays we have at our disposal more than 60 radiocarbon dates coming from barrow graves, generally from the eastern part of the country and allowing to positively place the earliest “Yamnaya” graves around 3100/3000 BC. However, at least 7 barrow graves from Thrace (6 inhumations and 1 cremation) and 4 graves from North-East Bulgaria (all inhumations) pre-date “Yamnaya” horizon dating to the timespan 3300 – 3100 BC. Several “flat” graves from North-East Bulgaria date to the same period as well. The situation is quite similar north of the Danube river, in Valahia, as well. The questions related to the nature of those graves, their geographical distribution and cultural affiliation will be discussed in the presentation.

3

### THE PIT-GRAVE CULTURE OF THE VOLGA-URAL INTERFLUVE: FEATURES DEVELOPMENT, AREA OF INFLUENCE AND CHRONOLOGY

**Abstract author(s):** Evgenyev, Andrey - Morgunova, Nina (Orenburg State Pedagogical University)

**Abstract format:** Oral

The Pit-Grave (Yamnaya) culture occupied the steppe area from the Danube River in the west to the Southern Urals in the east, has played a major role. The most stable Pit-Grave culture developed in the Volga-Ural interfluve, which presently consists of Volgograd, Saratov, Samara, Orenburg, and western Kazakhstan regions.

On the vast territory a community formed with a population of monotonous funeral rites practiced in the form of earthen mounds (kurgans) over the deep and large burial pits. Characteristic crouched posture of the dead is with a bending on the right side and sprinkling with ocher.

The population began to practice nomadic pastoralism, introduced wheeled transport (wood wheels and carriages) and used copper tools. Production of metal based on the Kargaly copper deposit was developed in the South Urals at that time.

Close cultural contacts of the population of Pit-Grave culture of the Volga-Ural interfluve are installed with the population of the Early Bronze Age of the Northern Black sea and also with the population of the forest zone of the Volga and Kama. Part of the Pit-Grave culture people migrated to the territory of South Siberia.

Due to the transition from the Eneolithic to the Bronze Age and the connection of many technological achievements with the Pit-Grave culture, it is especially important to solve the problem of the culture chronology and the stages of its development.

Now we have more than 100 14C-dates for the monuments of the Pit-Grave culture in the Volga-Ural interfluve. We can confirm the three-stage periodization of the Pit-Grave culture: the early (Repino) stage – 3700-3300 BC, the advanced (classical) stage – 3300-2600 BC with two A and B steps – 3300-2900 and 2900 - 2600 BC, and the late (Poltavka) stage – 2600-2300 BC.

The work is performed for the project RFBR № 18-09-40031.

4

### FROM YAMNAYA EAST TO YAMNAYA WEST? TRANSMISSION OF THE SACRED LANDSCAPE AT THE BEGINNING OF THE 3RD MILLENNIUM BC

**Abstract author(s):** Preda, Bianca (University of Helsinki) - Ahola, Marja (University of Helsinki)

**Abstract format:** Oral

When leaving their home people do not travel alone but take along their religion, beliefs and cosmology. Aside being easy to carry, religion also works as an anchor of collective identity and distinction among the migrants. For Yamnaya communities, building burial mounds seems to have been a meaningful gesture encompassing all these entangled aspects: the kurgans not only served organise the world of the living, shaping an otherwise flat and indefinite landscape, but they also preserved the memory of the dead.

In this presentation, we will focus on the process of transmission of religious and cosmological beliefs as steppe communities moved from their original homeland in the eastern European steppes to the western extremity of the steppe belt, in southeastern Europe, at the very beginning of the 3rd millennium BC. During this period, thousands of mounds were raised in the new areas, leaving a mark on the landscape that is still visible nowadays. These mounds were either built to flat steppe landscape or on top of previous settlements. At the same time, old mounds were re-visited with new burials.

In this lecture we consider this package of mortuary practices in the light of social memory, and suggest that ancestors – new and old – played an important role in the cosmology of the relocating populations. Accordingly, we suggest that the migrating Yamnaya aimed to (re)create the sacred landscape of their homeland. However, while building new mounds might be connected to the creation of new social memory with old practices, reusing older ones or raising them in places that were inhabited earlier implies a deliberate interaction with their past.

5

### AN OVERVIEW OF SOME RECENT EXCAVATED YAMNAYA BURIALS FROM DOBROUDJA, ROMANIA

**Abstract author(s):** Stefan, Cristian-Eduard - Vasile, Sandu-Gabriel (“Vasile Pârvan” Institute of Archaeology, Romanian Academy)

**Abstract format:** Oral

Due to the rescue excavation made in the last years in Romania on sites belonging to big infrastructure projects (highways, aeolian turbines) we have been able to reveal a significant number of Yamnaya burials, many of them being discovered in Dobroudja, a romanian province positioned between the Danube and the Black Sea. In this presentation we try to corroborate different data available

in the literature with other from new excavations in order to create an image of the burial customs of this interesting communities. By its topographic position Dobroudja is a very important way of communication between the north of the Black Sea and the Balkans, this fact being proved also by the mounds scattered in the landscape.

We gathered the data available from five sites (Aliman, Cernavodă, Medgidia, Rahman 1, Rahman 2) from the point of view of burial types, inventory, and radiocarbon dates. Also, over 50 skeletons analysed provided us important anthropological data for better understanding of this populations lifestyle.

6

### FROM WEST TO EAST: INTERACTION BETWEEN COPPER AGE CARPATHIAN COMMUNITIES AND YAMNAYA GROUPS SEEN IN THE FUNERARY RECORD

**Abstract author(s):** Ciugudean, Horia (Muzeul National al Unirii Alba Iulia) - Quinn, Colin (Anthropology Department, Hamilton College) - Beck, Jess (Anthropology Department, Vassar College) - Uhner, Claes (Romisch-Germanische Kommission des Deutschen Archäologischen Instituts) - Hansen, Svend (Eurasien Abteilung des Deutschen Archäologischen Instituts)

**Abstract format:** Oral

Current research has constantly overestimated the role played by the Yamnaya in the formation of the European Bronze Age, with the interpretation of ancient DNA studies having made the main contribution to creating this picture. In contrast, the role of the local South-East European ancestry in the development of the new Bronze Age societies was often neglected, in spite of its clear visibility in the archaeological and genetic records. The recent stream of Early Bronze Age discoveries made in the Transylvanian region (central Romania) has provided new evidence to deepen our understanding of the complex relationships between the Late Copper Age populations and the Eastern steppe groups. The barrows excavated in the Apuseni Mountains of southwestern Transylvania have clear ties with the local Copper Age Coțofeni culture (c. 3500–2800 BC), closely related to the larger Baden complex. A different tradition, which might be connected to the Yamnaya expansion towards the Carpathian Basin, is detectable in the earthen mounds of the lowland Transylvanian Plateau. The constant deposition of the copper spectacle-shaped pendants in the tombs of the Apuseni Mountains correlated with its occurrence in the Yamnaya burial contexts outside the Carpathians, and even further into the North-Pontic region, clearly shows the complexity of interaction and networking between local and Yamnaya societies in the 3rd millennium BC. The deposition of local Coțofeni- and Foltești-type pottery within the pit-graves of the earthen mounds east and south of the Carpathians represents further strong evidence for the reciprocity of the cultural exchange. Our analysis, in correlation with the results of the first major isotopic study of Early Bronze Age mobility and diet in southwestern Transylvania, show a rather different picture than the one of conquering Yamnaya tribes largely promoted thus far.

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### WHAT HAPPENS IN THE WORLD OF LIVING? THE COMPLEX OF GENERALKA 2 IN UKRAINE IS OUT OF YAMNAYA CULTURE TRENDS

**Abstract author(s):** Radchenko, Simon (New archaeological school; University of Torino) - Tuboltsev, Oleg (New archaeological school; National Reserve “Khortytsia”)

**Abstract format:** Oral

Among numerous synonyms for “Yamnaya culture” there is one that precisely reflects the phenomenon altogether with the problems of its understanding. “Pit grave culture” is the direct translation from Russian. Indeed, our knowledge of Yamnaya culture representatives is based on burial pits covered with red ocher and other features of burial practice. Nowadays we understand how these people used to die quite well. However, many problems arise when we try to define how they lived.

Yamnaya culture settlements are quite rare. Besides, most of them are very different in their features — topography, dwellings architecture, pottery collection, interaction with neighbors etc. For instance, famous Mykhailovka settlement is very different to Generalka 2 site on Khortytsia Island.

Generalka 2 consists of two cultural levels and combines many typical Yamnaya culture features with a huge number of distinctions. In its first phase it was seemingly a ditch-bordered sacred place, that is very similar to causewayed enclosures, previously unknown in Ukrainian Steppe. It is very different to known Yamnaya culture sites; however, according to radiocarbon analysis, habitation features and ceramic collection it belongs to early Yamnaya culture.

Pottery from the second phase is similar to those of developed Yamnaya culture. But the grade of homogeneity and the vessels profile shapes make this collection unique. Although similar pottery was found in the multilayer settlement nearby, the complex is rather a unique object than a typical Yamnaya site.

All aforementioned is evident that Generalka 2 is a unique site of Early Bronze Age. Besides, we should ask again: do we understand the Yamnaya culture phenomenon correctly? Should we directly link Yamnaya culture graves to simultaneous settlements nearby? Probably, our understanding of this phenomenon is distorted by long-term studying of burial places. This means we should pay extra attention to the settlement sites of Yamnaya culture.

8

### CORD IMPRESSED DECORATION ON POTTERY AND YAMNAYA CULTURE IN SOUTHEASTERN EUROPE

**Abstract author(s):** Semmoto, Masao (University of Tsukuba)

**Abstract format:** Oral

This paper discusses the transmission of cord impressed decoration on pottery from archaeological sites of Yamnaya and indig-

enous cultures in southeastern Europe, based on the analysis of typological-technical and chronological perspectives. The cord impressed decoration on pottery appeared in the Balkan-Carpathian regions at the end of the 4th millennium / the very beginning of the 3rd millennium BC. It has been often seen as one of the Yamnaya cultural elements, whose characteristics vary by region, although some parallels have been found beyond the areas so far. Besides, most of them have been excavated not only from Kurgan but also from the settlements. The older limit of the cord impressed decoration on pottery from them can be dated back to around 3000 cal BC.

This analysis enables us to identify similarities and differences of the cord impressed decoration in the Kurgan burials and the settlements west of the Pontic area and to discuss their chronological position. By this, the paper illustrates the factor that the cord impressed decoration brought to the Balkan-Carpathian area from the Northwest Pontic area does not necessarily result only in Yamnaya. Furthermore, by examining the process in which the cord impressed decoration spread to the Balkan-Carpathia area in the 3rd millennium BC, it is shown that the transmission of the cord impressed decoration played a role in the formation of more intricate networks the west of the Black Sea than has been assumed.

9

### APPREHENDING THE INTERCONNECTION BETWEEN YAMNAYA, GLOBULAR AMPHORA AND CORDED WARE PEOPLES

**Abstract author(s):** Heyd, Volker (University of Helsinki)

**Abstract format:** Oral

Recent ancient DNA and archaeological research has highlighted the importance of the whole Yamnaya-Corded Ware-Bell Beaker complex in an ethnical, social and cultural upheaval covering all of Europe in the 3rd Millennium BCE. However, we are only at the beginnings to comprehend what kind of transmission has happened between Yamnaya and Corded Ware users, and what is the role Globular Amphora people therein who seem to have concurrently, between 3000 and 2800 BCE, expanded eastwards while the prevailing current went the opposite. No doubt, this creates the perfect scenario for a clash of cultures. However critical will be to understand the mechanisms of how societies transform when they cross boundaries, ie. of steppe versus forest steppe; river systems encroaching into other ecozones; and flatlands versus hilly/mountainous regions. The paper shall present latest evidence from all sides about this special relationship, the distances covered, speed and scale, those outcomes were –within a few generations only – determining the future of the European Continent.

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### SAME STOCK, SAME LIFESTYLE? SKELETAL REMAINS OF CORDED WARE CULTURE AND YAMNAYA CULTURE BURIALS IN CENTRAL AND SOUTHEASTERN EUROPE

**Abstract author(s):** Trautmann, Martin - Heyd, Volker - Preda-Balanica, Bianca (University of Helsinki) - Franculeasa, Alin (History and Archaeology Museum of Prahova Departament · Archaeology)

**Abstract format:** Oral

The closer archaeological research deals with the Yamnaya culture from the North Pontic steppe region and its influence on Europe in the first half of the 3rd millennium BC, the clearer its connections to the Corded Ware Culture complex in Northern and Central Europe become.

Pronounced similarities in individual characteristic elements of material culture and burial custom have been known for decades and have been intensively discussed archaeologically. More recently, anthropological and paleogenetic studies have been added, which show that these two cultural complexes are very similar with regard to the biological populations and way of life too.

So far, however, these studies have been based on rather limited sampling; in particular there is a lack of extensive bioarchaeological comparative analyses.

Within the YMPACT project “The Yamnaya Impact on Prehistoric Europe”, such analyses are part of the anthropological studies and - together with the results of paleogenetics and isotope analyses - are intended to clarify biological relationship, but also aspects of lifestyle and economy, including diet. The applied research strategies and first results are presented here.

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### TWO ORIGINS OF THE CORDED WARE SOCIETIES IN SOUTH-EASTERN POLAND

**Abstract author(s):** Włodarczak, Piotr - Szczepanek, Anita - Jarosz, Paweł (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

**Abstract format:** Oral

The funeral ritual of the Corded Ware communities in south-eastern Poland has already been discussed many times in the perspective of relations with eastern Europe. Suggestive arguments indicating the strength of these connections were the forms of graves: burial mounds and catacomb constructions. To a lesser extent, this relation was documented by material culture certificates - elements of grave inventories. New arguments to verify the hypothesis of the Eastern genesis of Corded Ware are provided by recent bioarcheological analyzes. Most important are: the research on stable strontium isotopes and the effects of archaeogenetic analyzes. Their juxtaposition with previously presented results of studies on the rules of funeral rites leads to an interesting conclusion: in the third millennium BC there were several waves of migration of people of Eastern European origin. Two horizons are clearly visible, of which the first (around 2800-2600 BCE) has a relation to the Yamnaya circle. The second (c. 2600-2400 BCE) shows a relationship with the Catacombnaya circle. The relationship between the Lesser Poland Corded Ware and the Middle Dnieper circle



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from the Forest-Steppe/Forest border of the Eastern European zone is also interesting. The importance of relations with these areas confirms the original character of the funeral rite in the younger phase of the South-Eastern Corded Ware, including the specific nature of grave inventories.

### THE EMERGENCE OF THE CORDED WARE CULTURE IN THE SOUTHWESTERN BALTIC

**Abstract author(s):** Schultrich, Sebastian (Institut fuer Ur- und Fruehgeschichte Kiel)

**Abstract format:** Oral

In northern Germany, the transition from Funnel Beaker (FBC) to Corded Ware (CWC) societies is allegedly marked by massive changes in burial traditions and the emergence of a new material culture. Generally, scholars assume that the preceding megalithic tombs became meaningless and single burials now predominate. In these burials we find a novel material culture – banded battle axes and cord decorated pottery. These novelties are claimed to be combined with a re-organisation of land use and this, potentially, was driven by an immigrating people.

Although this notion has been contested in several studies that highlight continuities in the material culture, the notion of an ideological break, the emergence of a novel CWC-identity, however, survived to this day. Changes still are observable in non-mundane activities such as burial traditions and by the abandonment of former inhabited areas and special places.

However, this does not apply for northern Germany. This interpretation is influenced by observations made in present-day Denmark in combination with a cherry picking of evaluating burial contexts only. If single finds are considered, the strict geographical exclusion of both cultures which is usually stressed, is not present any longer. Furthermore, the CW-societies re-used megalithic tombs of the FBC regularly. This is especially true for the southwestern part of the Cimbrian Peninsula. In this area, moreover, a FBC causewayed enclosure has been re-used by the CWC. This is a unique find strongly indicating that the FBC and CWC people had a common identity.

In this talk, more aspects will be shown that demonstrate continuities between FBC and CWC, which have been widely overlooked. For this purpose, battle axes will be highlighted.

In the southwestern Baltic, the transition FBC – CWC was not driven by immigrating people neither did the identity alter massively. Consequently, this is a phase of continuity.
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### THE BURIAL GROUND OF DALFSEN: FROM TRB TO CORDED WARE CULTURE: INVESTIGATING CONTINUITY IN TIMES OF CHANGE IN THE NETHERLANDS

**Abstract author(s):** Van der Velde, Henk (ADC ArcheoProjecten; University of Groningen)

**Abstract format:** Oral

Recently, a lot have been written on large scale changes with the introduction of the beaker cultures in Europe. In 2015 in Dalfsen (Netherlands) a burial ground consisting of 142 burials mainly dating from the TRB period was excavated. The results of the detailed analyses of the burial pits, burial monuments and material culture raise interesting questions about the so-called discontinuity between both periods. At Dalfsen the deceased were individually buried in pits. By combining the results of the study of the material culture from Dalfsen and several Dutch megalithic monuments one may state that already during the TRB-period burial custom was more individually oriented than previously thought.

Although differences are visible the parallels in burial custom and raising of burial mounds between late TRB and Corded Ware culture might indicate that we have to evaluate the current narrative of European wide changes and look to this phenomenon from a more regional point of view. In this contribution the results of the excavation and its implications for the study of late TRB culture will be presented.
- a.

### FOREIGN – LOCAL INTERACTION: THE CASE OF GRAVE Nº 30 FROM THE BURIAL MOUND NEAR VILLAGE OF MOGILA, YAMBOL REGION

**Abstract author(s):** Valchev, Todor (Regional Historical Museum - Yambol)

**Abstract format:** Poster

At the end of the 4th millennium BC bringer of the Pit-grave culture appeared in the area south of Stara planina Mountain and in the valley of Tundzha River – in present day south-east Bulgaria. These people were nomads who buried their dead in burial mounds.

The aim of the present poster is to present the special case of grave Nº 30 from the burial mound near village of Mogila. During the archaeological excavations 30 graves were uncovered. Nine of them were connected to the Pit-grave culture and one was also assigned to the first phase of Early Bronze Age (grave Nº 30), being thus contemporary.

Grave Nº 30 does not comply with the standard funeral practice of the Pit-grave culture. The burial was performed on a burnt fill in a crouched position on the right side. The dead body was laid while the wood was still burning. Near to the left hand of the individual was found a hand-made ceramic bowl. It’s typical local production during the first phase of the Early Bronze Age in the region (Ezero culture). It was full of grain. According to interpretation of researchers grave Nº 30 represents the sacrifice of a local person during the burial of the primary grave Nº 29 of the Pit-grave culture.

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### TRULY INTERDISCIPLINARY SCIENCE! CERAMIC, METAL, GLASS, AND STONE PROVENANCING STUDIES AS TOOLS TO UNDERSTAND THE ARCHAEOLOGY OF TRADE AND EXCHANGE

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Godfrey, Evelyne (Uffington Heritage Watch) - Joosten, Ineke (Netherlands Cultural Heritage Agency) - Nørgaard, Heide (Aarhus University) - Kasztovszky, Zsolt (Centre for Energy Research)

**Format:** Regular session

This session will consider the contribution that interdisciplinary Heritage Science applications (e.g. preferably non-invasive X-ray, electron, ion beam, and neutron methods), are making to archaeological narratives of production, trade, and exchange of goods. We welcome studies that seek to characterise material resources such as ore deposits, and to define the geographical provenance of raw materials, and of excavated artefacts.

There are huge databases, collected from the 1960s onward, of neutron activation analyses and X-ray fluorescence and other elemental spectroscopic analyses of metal artefacts (Bronze Age European material in particular), archaeological ceramics, glass, stone, and obsidian. In the past twenty years, databases have been built up of isotopic analyses, in particular lead isotope analysis, of metal ores and artefacts, and glass as well. How far have these large data-sets been used to broaden our understanding of the processes and motivations of early production, trade and exchange? In this session, we would like to highlight the importance of scientific studies in archaeology to add new information and to develop new narratives.

We invite contributions that address issues, theories, new analytical methods, and applications relating to scientific provenancing of archaeological materials.

  - Which method or combination of methods works best for which material and/or archaeological period? And what are the limitations for particular methods applied to various materials?
  - Are databases readily accessible and comparable, and are researchers successfully provenancing artefacts?
  - How are archaeologists integrating new scientific methods and data into their interpretations and narratives?
  - Are innovative methods leading to new insights that challenge existing paradigms in archaeology?
  - How can researchers access Heritage Science research infrastructures, especially at large-scale facilities?

We also invite presentations on insights that provenance studies provide into understanding technological changes in any past society world-wide, and on understanding of material culture through social-economic relationships.
- ABSTRACTS

1

### NEW INSIGHTS INTO EBA - MBA COPPER PRODUCTION IN EASTERN SERBIA - THE SMELTING SITES OF TRNJANE, RUŽANA, ČOKA NIJCA

**Abstract author(s):** Mehofer, Mathias (Vienna Institute for Archaeological Science, University Vienna) - Kapuran, Aleksander (Institute of Archaeology, Belgrade) - Gavranovic, Mario (OREA, Austrian Academy of Science, Vienna)

**Abstract format:** Oral

Within the framework of an ongoing interdisciplinary research project (FWF project no. P 32095, New insights in Bronze Age metal producing societies) which focuses on a diachronic overview on the metal production, consumption and metal exchange among Bronze Age societies in the area of central and western Balkan it was possible for the first time to examine three copper smelting sites in the region of Bor (Eastern Serbia). The systematic excavations at the sites Trnjane, Ružana and Čoka Nijca brought to light various remains of copper smelting activities. In Ružana, a slag pit and the fragments of a furnace were detected, in Trnjane numerous slags were found within the settlement and the graveyard while in Čoka Nijca a smelting installation and slags were excavated. The several 14C dates from both bones and charcoal point to metallurgical activities around 1800 BC. The slags can be divided by their morphology and surface structure in three main groups. The first group is formed by slags with a dark grey, irregular surface and circular shape. The second group comprises thick slags with a flat surface and a hooked edge at the bottom (massive slag), the third group consist of plate slags (Plattenschlacke). The morphology as well as the microstructure (with many matte inclusions) indicate a multi-step copper smelting processes. The provenance of the used sulfidic ores (chalcopyrite, covellite), can be assigned to the nearby copper ore deposits. The discussion of these results will form the first half of the lecture. In the second half we will focus on the question if and how the observable smelting technology of these early dated sites can be set in relation to other sites with similar date and metallurgical activities in Europe e.g. in the Alpine region?

2

### METALWORK EXCHANGE IN EARLY ITALY: AN INTERDISCIPLINARY INVESTIGATION

**Abstract author(s):** Dolfini, Andrea (Newcastle University) - Angelini, Ivana (University of Padova) - Artioli, Gilberto (University of Padova)

**Abstract format:** Oral

The paper discusses results of an interdisciplinary research project integrating lead isotope, chemical, and archaeological analysis of 20 early metal objects from central Italy. The aim of the research was to develop robust provenance hypotheses for 4th and 3rd millennia BC metals from an important, yet previously neglected, metallurgical district in prehistoric Europe, displaying precocious
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copper mining and smelting, as well as socially significant uses of metals in burial. All major (and most minor) ore bodies from Tuscany and neighbouring regions were characterised chemically and isotopically, and 20 Copper Age axe-heads, daggers and halberds were sampled and analysed. The objects were also reassessed archaeologically, paying special attention to find context, typology, and chronology. This multi-pronged approach has allowed the authors to challenge received wisdom concerning the local character of early metal production and exchange in the region. The research has shown that most objects were likely manufactured in west-central Italy using copper from southern Tuscany and, quite possibly, the Apuanian Alps (northwest Tuscany). A few objects, however, display isotopic and chemical signatures compatible with the Western Alpine and, in one case, French ore deposits. This shows that the Copper Age communities of west-central Italy participated in superregional exchange networks tying together the middle/upper Tyrrhenian region, the western Alps, and perhaps the French Midi. These networks were largely independent from other metal displacement circuits in operation at the time, which embraced the north-Alpine region and the south-eastern Alps, respectively. The research has painted a bold new picture of copper exchange dynamics in late Neolithic and Copper Age Europe, paving the way for the superregional trade networks that came into being in the Bronze Age.

3 **COPPER ISOTOPE FRACTIONATION DURING PREHISTORIC COPPER SMELTING: EVIDENCE FROM ARCHAEOLOGICAL SMELTING EXPERIMENTS**

**Abstract author(s):** Rose, Thomas (Department of Bible, Archaeology and Ancient Near East, Ben-Gurion University of the Negev, Be’er Sheva; Department of Antiquity, Sapienza University of Rome) - Klein, Sabine (Forschungsbereich Archäometallurgie, Deutsches Bergbau-Museum Bochum; FIERCE, Frankfurt Isotope & Element Research Centre, Goethe Universität)

**Abstract format:** Oral

Weathering processes alter the Cu isotope composition of ores in deposits and lead to a characteristic Cu isotopic zonation within ore bodies. This information can provide information about the exploitation history of ore deposits (Klein et al., 2010) and this can complement provenance information obtained by lead isotopes and trace elements. To link the metal to the ore it was derived from, the smelting process must not alter the Cu isotopic composition of the ore. This was previously investigated for malachite ores but investigation for the much more widely used sulphide ores was lacking. However, the combination of oxidative roasting and reductive smelting provides very beneficial conditions for Cu isotope fractionation to occur.

To investigate the behaviour of Cu isotopes, a series of archaeological smelting experiments was carried out from crushing of the ore until the production of metallic copper from the matte. All material used and produced in the experiments were sampled and analysed for their Cu isotope composition.

After a short presentation of the experimental set-ups and an evaluation of the experimental outcomes, this contribution will provide evidence for Cu isotope fractionation during smelting. Fractionation does not occur between ore and metallic copper but during the formation of the slag. Different reasons for Cu isotope fractionation could be identified, among them e.g. the influence of fluxing materials. Hence it does not affect applications of Cu isotopes directly on the metal but has serious implications for the application of Cu isotopes on the material, which is most abundant and most likely available for analyses from archaeological sites: the waste products.

References:

- Klein, S., Brey, G.P., Durali-Müller, S., Lahaye, Y., 2010. Characterisation of the raw metal sources used for the production of copper and copper-based objects with copper isotopes. *Archaeol Anthropol Sci* 2 (1), 45–56.

4 **COPPER MINING IN LOWER AUSTRIA: THE CASE OF PRIGGLITZ**

**Abstract author(s):** Mödlinger, Marianne (University of Genoa) - Trebsche, Peter (Universität Innsbruck)

**Abstract format:** Oral

Priggltz is a well-known, Late Bronze Age copper mining site in Lower Austria in the south of Vienna. First interdisciplinary analyses comprising archaeobotany, geophysics, mineralogy, dendrochronology and C14 measurements, as well as archaeometallurgical analyses show a quite complete image of life and work at the mining site. Several different working steps in metal (object) production were detected. Archaeometallurgical analyses comprise metallographic and chemical analyses, as well as lead isotope analyses. Especially the latter, in combination with further analyses of finds from the closer surrounding of the mining site, provide an interesting picture of copper and/or copper ore on the move. We will discuss first results and difficulties in gaining further information about the metal movements, and will outline the metal production and processing steps which took place at Priggltz. A special focus will be on the identification of the chemical and isotopic characterisation of the mining site, and the difficulties that go with it.

5 **SUPER REGIONAL CONTACTS AND THE EARLIEST METALLURGY IN EARLY NEOLITHIC FUNNEL BEAKER SOCIETY IN SOUTH SCANDINAVIA**

**Abstract author(s):** Gebauer, Anne Birgitte (National Museum of Denmark)

**Abstract format:** Oral

The introduction of the first metal in South Scandinavia at the turn of the 4.th - 5.th millennium is a prime example of long-distance exchange of knowledge, ideas, and materials between people in the north and in central Europe. Rare imports of copper axes into the region’s Late Mesolithic communities as early as c. 4400 BC is the first indication of an awareness of copper technology. During

the 4.th millennium, the numbers of copper axes and trinkets testify to a substantial increase in the incoming flows of copper to the region. Around 3300 BC the metal disappears, and metallurgy seems absent from southern Scandinavia during most of the third millennium. Hypotheses that local metallurgy was actually practiced in the Early Neolithic Funnel Beaker period has been substantiated by a recent discovery of a crucible and a putative tuyère. Apparently not only metals but also knowledge of the practice of high-temperature melting and perhaps also ideas related to the role of metal objects in society were communicated through the long distance exchange networks raising questions of the possibility of itinerant craftsmen. The chemical composition of the copper residues as well as the shape and function of the Danish crucible is discussed in relation to crucibles found in the copper producing communities in the northern Alpine area. The nature of the trade and exchange connections between Scandinavia and central Europe is analyzed. Finally, the role of metallurgy and copper objects in early Neolithic Funnel Beaker societies in the north will be addressed.

6 **PROVENANCING CERAMICS BY HEAVY MINERAL INVESTIGATIONS AND ROLE OF THE MICROMINERALOGICAL COLLECTION OF THE MINING AND GEOLOGICAL SURVEY OF HUNGARY**

**Abstract author(s):** Szinger-Szilágyi, Veronika (Centre for Energy Research) - Péterdi, Bálint (Mining and Geological Survey of Hungary) - Szakmány, György - Józsa, Sándor - Miklós, Dóra (Department of Petrology and Geochemistry, Eötvös Loránd University) - Gyuricza, György (Mining and Geological Survey of Hungary)

**Abstract format:** Oral

Provenance studies of archaeological pottery apply different approaches to determine the sources of ceramic raw materials. Beside chemical investigations, detailed textural and mineralogical characterization by means of conventional petrography or SEM-EDS methods is a powerful approach. The exact determination of heavy mineral components of the ceramic matrix provides possibility to connect it directly to the clastic raw material type (region of source) applied.

The micromineralogical collection of the Mining and Geological Survey of Hungary contains the surficial/near surface alluvial clastic sediments of the whole territory of the country with 863 sampling points (4326 individually inventoried samples). The samples originate from 510 mines (sand/gravel mines, Miocene to Holocene age sediments), 145 recent river-bars, and 99 shallow drilling samples of older alluvial cones. Each sample was separated into 5 or 6 (ferromagnetic, more paramagnetic, diamagnetic, and residual light minerals) fractions. Originally, the collection was established for reconstructing the sedimentation history of the filling-up Pannonian Basin, but it is well applicable for archaeometric studies too. As a result of the continuous evaluation, qualitative-quantitative information on the overall mineralogy is being accumulated. These data are appropriate for a direct comparison to mineral species detected in archaeological pottery by conventional petrography or SEM-EDS. The knowledge on the heavy mineral assemblages of potential raw material territories is the key to the successful provenance determination.

In our presentation, applicability of the comparative method is demonstrated via examples from the archaeological ceramic record of Hungary.

7 **PROVENANCE STUDY OF POLISHED AND GROUND STONE ARTEFACTS IN THE CARPATHIAN BASIN AND ITS SURROUNDING FROM AN ARCHAEOLOGICAL PERSPECTIVE**

**Abstract author(s):** Szilagyi, Kata (Mora Ferenc Museum) - T. Bíró, Katalin (Hungarian National Museum) - Szakmány, György (Eötvös Loránd University) - Péterdi, Bálint (Mining and Geological Survey of Hungary) - Szilágyi, Veronika - Kasztovszky, Zsolt (Centre for Energy Research)

**Abstract format:** Oral

The main goal of the paper is to present a new multidisciplinary project which focuses on the raw material sources of polished and ground stone artefacts in the Carpathian Basin and its surroundings during prehistoric times. In the last few decades archaeometrical methods have been improved a lot from the technological and analytical point of view and has thus become a primary basis of non-destructive lithic research. The main question for provenance studies of lithic artefacts is the identification of prehistoric raw materials, the location and characterisation of their geological sources. The geochemical fingerprints help to detect the connections between archaeological sites and the primary geological sources. We have a lot of information about some special, prestigious materials, which probably had a high value in prehistoric communities, and their distribution and circulation along several long-distance trade/exchange systems. Our goal is to integrate this ‘provenance data-set’ into an archaeological narrative, specifically relating to the ways in which the quantities of raw material extraction, circulation, production and use of objects is connected to changes in the social systems (social complexity, inequality). To study these questions, it is of crucial importance to understand the potential value of lithic artefacts, which can be approached by investigating the contextual allocation of the different procurement, production and deposition practices of the prehistoric communities. We will investigate the following questions:

1) Which rock types were preferred by the different prehistoric communities and why? 2) What were the distances of transport and the possible mechanism of mediation? 3) What are the estimated quantities of objects in different periods? 4) How do raw material varieties relate to the artefact types and what is their distribution pattern in space and time?



8	<p><b>VHOLYNIAN FLINT AS A KEY FOR DEFINING PREHISTORIC ROUTS OF EXCHANGE</b></p> <p><b>Abstract author(s):</b> Sliesariiev, Yevhenii (Cluster of Excellence ROOTS, Christian-Albrechts-Universität zu Kiel)</p> <p><b>Abstract format:</b> Oral</p> <p>In the 3d mill. BC territories between the Baltic Sea and the Black Sea were covered by multi-cultural and multi-directional contact system. The Vistula – Western Bug – Dniester rivers formed natural conductor of the ideologies, people, technologies. Naturally dividing different climatic zones (forests/forest-steppe/steppe zones) this region became a contact zone for different economies. The existence on these territories of high quality raw material as Volhynian flint and made them even more important for the Central European processes. Intensification of contacts, penetration of the new communities and new technologies forced people to provide new social ideologies, building new social organizations and structures to face the new Age problems. New technologies and economy systems led to increasing of mobility of different societies which often caused high tension between them and inside.</p> <p>In the literature related to intercultural interactions we can find mentions of the existence of flint material from far-distance out-crops: in particular, it is common to talk about Volhynian flint on different sites around Central-Eastern Europe. Nevertheless, the problem is that the current definition of “Volhynian flint” is based only on a subjective vision of researchers. It is common to call greyish-brownish coloured flint “Volhynian”.</p> <p>Nowadays in modern archaeology researchers came to the same conclusion that from the ethical view at science it is needed to provide non-destructive and non-invasive methods to protect single artefacts and archaeological heritage in general. In this case XRF method for studying flint looks most optimal in case of distinguishing different raw materials. This method can clearly count consistence of Ca and Fe which usually generated the highest count rates. By these two elements (but not only) it is possible to define provenance of different raw material, and so far distinguish different artefacts in each collection by its origin.</p>
9	<p><b>THE PROVENANCE OF CINNABAR PIGMENTS FROM ROMAN EPHEBUS.</b></p> <p><b>Abstract author(s):</b> Rodler, Alexandra - Verbeemen, Eliah - Goderis, Steven (Analytical, Environmental and Geo-Chemistry Research Group, Department of Chemistry, Vrije Universiteit Brussel) - Bolea-Fernandez, Eduardo (Department of Chemistry, Gent University) - Artioli, Gilberto (Department of Geosciences, University of Padova) - Sørensen, Lasse (The National Museum of Denmark) - Fragnoli, Pamela - Ladstätter, Sabine (Austrian Archaeological Institute, Austrian Academy of Sciences)</p> <p><b>Abstract format:</b> Oral</p> <p>One of the most valuable pigments used in antiquity was Minium Cinnabaris. The red mercury sulfide cinnabar (<math>\mu</math>-HgS), forms this bright red pigment when powdered and was an expensive and likely imported raw material to the Roman Empire. Despite its widespread use, little is known about production centres and trade. The largest known cinnabar deposits in the Mediterranean region are Almadén (Spain), Idria (Slovenia) and Monte Amiata (Italy), with smaller deposits in e.g. Turkey and France. With a combination of trace element, lead and mercury isotope data, we evaluate the provenance of cinnabar used as pigment for wall decorations during the Roman period at the city of Ephesus (western Turkey). Were small, but easily accessible ore deposits near Ephesus used, or were distant, but well-exploited sources preferred? The local cinnabar ores near Ephesus are of suitable quality for pigment production; moreover, cinnabar pigments can be found on wall fragments from different building phases at Ephesus. Particularly from various living units of Terrace House 2 (buried by the 3rd c. AD), but also from the less well-preserved Terrace House 1, where red and relatively big wall fragments reach mercury concentrations of up to 11 % (hh-XRF). The lead concentrations are significantly lower compared to mercury, while iron varies considerably, and in some cases, reaches concentrations equally high as mercury. This might indicate a certain preference for mixing red ochre (hematite) rather than minium (red lead) pigments with cinnabar. Variations in the mercury and lead isotopic composition of the analysed cinnabar pigments can dismiss less likely geological sources used for producing these specific pigments. This holds the potential to indicate whether the Ephesian cinnabar pigments were locally produced or imported. Our work contributes significantly to reconstructing trade in pigments and to our understanding of economic aspects of ancient civilizations.</p>
10	<p><b>A DEVIANT GROUP OF CAROLINGIAN/OTTONIAN PERIOD DISC BROOCHES FROM THE NETHERLANDS, EXPLORED USING NON-DESTRUCTIVE PXRF</b></p> <p><b>Abstract author(s):</b> Roxburgh, Marcus Adrian (Leiden University)</p> <p><b>Abstract format:</b> Oral</p> <p>Aspects of the production and exchange of Carolingian/Ottonian disc brooches are discussed through an interdisciplinary analysis of 281 brooches selected from across The Netherlands. Their composition was explored non-destructively with a pXRF device and the results showed a sharp deviation from the alloys used in brooches from earlier periods. The results across all geographic areas suggested a mixture of copper, zinc and lead, but no tin. This uniformity suggests that production was more likely organised on a regional or even super regional scale. An analysis of production models suggested that the great abbeys were the most likely source of these objects. But If we assume that the disc brooches found on the Dutch island of Walcheren - for many years under Viking not Frankish control - conform to this hypothesis, they should originate from this monastic production model. However, 15 brooches were found on the island that substantially deviated from this alloy. This required some additional explanation. The variety of alloys within this deviating group suggests that consistency was not important, perhaps indicating a different production centre working in isolation from the Frankish hinterland. A production site at an emporia or trading post, perhaps under Danish administration, seems</p>

11	<p>a better fit.</p> <p><b>OBSIDIAN ARTEFACTS FROM THE PRE-COLUMBIAN SITE OF NAKUM (PETÉN, GUATEMALA). PROVENIENCE, PROCESSING AND FUNCTION – RESULTS OF PRELIMINARY ANALYSIS</b></p> <p><b>Abstract author(s):</b> Stefanski, Damian (Archaeological Museum in Kraków) - Glascock, Michael (Archeometry Laboratory, Research Reactor Center, University of Missouri) - Pilarski, Bogumił (Auschwitz-Birkenau State Museum) - Żrałka, Jarosław (Institute of Archaeology of the Jagiellonian University)</p> <p><b>Abstract format:</b> Oral</p> <p>During the 10 seasons of archaeological research carried out at the Maya site of Nakum (Guatemala) between 2006 and 2016, an interesting collection of obsidian artefacts was acquired. They come from several different chronological horizons related to the development of Maya culture in the lowlands of Central America. The study of this group of artefacts was aimed at reconstruction of obsidian use and exchange at Nakum in a wider cultural and geographic context.</p> <p>A crucial goal of the investigation was to determine the exact sources of obsidian and try to reconstruct trade connections Nakum had during different periods of its development. For this reason we used the XRF method which revealed that obsidian was transported to Nakum from several different locations in southern Guatemala and more distant sources situated in Mexico. Worth mentioning is a high correlation of the XRF studies with macroscopic analysis carried out in Guatemala. The assemblage underwent a standard lithics analysis which determined the technological and typological contexts of all analysed implements. The entire inventory consists mainly of blades which are supplemented by core fragments and individual flakes. The use-wear traces appear on most of the collected artefacts. The repeatable pattern points to high specialisation of obsidian implements which were used most probably as insets.</p>
12	<p><b>DISCOVERING NEW TENDENCIES IN THE NORDIC BRONZE AGE BASED ON LARGE-SCALE METAL PROVENANCE ANALYSIS, 2100-1300 BC</b></p> <p><b>Abstract author(s):</b> Noergaard, Heide (Aarhus University, Dep. Culture and Society) - Pernicka, Ernst (Curt-Engelhorn Center for Archaeometry) - Vandkilde, Helle (Aarhus University, Dep. Culture and Society)</p> <p><b>Abstract format:</b> Oral</p> <p>The Nordic region was dependent on one crucial exogenous resource- metal. While it is well known that Scandinavia did not exploit its metal ores in prehistory, from 2100BC to 1600BC, the amount of metal in circulation within the region rose 50- 500kg (per hundred years). Therefore, the origin of those metals is crucial for understanding cross-European interconnectivities established through the metal trade. These interconnectivities brought about changes within the political economy which undoubtedly resulted in the establishment of the Nordic Bronze Age. Moreover, emerging large-scale mobility studies highlight an increase in human mobility towards the 1600BC threshold.</p> <p>This presentation discusses the shifting networks in the Nordic Bronze Age (from its onset to its peak) based on the results of the international cooperative project entitled “An Archaeological Fingerprint”. Here, over 550 metal artefacts dating from 2100-1300 BC were analysed for their trace element compositions and lead isotope signatures. First analysis revealed both the existence of Continental trading routes (connecting the eastern Alps and Slovakian ore mountains with Southern Scandinavia) as well as maritime and river trade routes (indicated by British and Welsh metal in early Bronze Age Scandinavia). Even in the earliest Bronze Age, we could see evidence for the mixing of metals. This presentation presents the analytical results from 1700BC onwards. This body of information represents the second half of the project’s overall dataset. The comprehensive approach investigating the stylistic characteristics of artefacts, trace element compositions and lead isotope data source critically allows us to trace the probable provenance of the artefacts, but to also identify an increase in the mixing of ingot-like artefacts along the edges of metal-using societies. Furthermore, this new knowledge of shifting networks, mixing metals and controlling elites opens up discussion regarding new trends in the Nordic Bronze Age- that are also visible in mobility studies.</p>
13	<p><b>PROVENANCING METAL AND GLASS IN THE IRON AGE. HOW TO SCIENTIFICALLY APPROACH “COMPLEX ECONOMY”?</b></p> <p><b>Abstract author(s):</b> Danielisova, Alzbeta - Bursák, Daniel (Institute of Archaeology CAS, Prague) - Pajdla, Petr (Masaryk University, Brno) - Strnad, Ladislav - Trubač, Jakub (Charles University, Prague)</p> <p><b>Abstract format:</b> Oral</p> <p>When attempting provenance analyses, we need to bear in mind that these are rarely straightforward and usually comprise many challenges. What scale of production we are talking about? What sort of production strategies? How to successfully detect mixing and/or recycling? Problems with provenancing include also obscuring the signal of individual alloy components (copper, vs. lead), overlapping of ore deposits, general lack of data for individual time periods (Iron Age in particular). The list goes on and on ...</p> <p>This contribution aims to be mostly methodological. We would like to focus on methodical approaches to the data analysis, their chemical composition (i.e. the trace element patterns) and lead isotopic ratios alike to discuss potential approaches to data evaluation.</p> <p>Sometimes the most complex mathematical modelling does not do any good and more simple evaluation methods (Principal Com-</p>



ponent Analysis, K-means clustering, Linear Discriminant Analysis etc.) combined with empirical observations can be the most effective in recognising the data patterns in relation to provenance. Sometimes even smallest differences between the values can be important provenance or technology-wise.

On the basis of selected case studies from the La Tène period (4th – 1st century BC) we aim to demonstrate how the provenancing studies may become challenging in context of historical paradigms – especially migrations, political events and socio-cultural aspects, when not only the “most local deposits” are the ones in the picture.

## 14 IRON FROM THE NETHERLANDS: CAN WE PROVENANCE EARLY HISTORICAL DUTCH IRON USING SLAG INCLUSION CHEMISTRY?

**Abstract author(s):** Joosten, Ineke (Cultural Heritage Agency of the Netherlands)

**Abstract format:** Oral

In the Netherlands iron was produced on a large scale in Roman times and in the Early Middle Ages. However, only few well dated iron objects were found in the Early Mediëval Dutch iron producing area the Veluwe. Can we be sure these iron objects were produced locally? Iron production experiments using the local ore, rattlestones, were performed to test if the chemical fingerprint of the ore and slags can be traced into the slag inclusions of the iron. Subsequently, slag inclusions in early historical iron objects, dating from the Iron Age, Early Middle Ages and the 17th century, were also analysed. The objects from the Iron Age and the 17th century were certainly imported, and the Early Medieval one most probably produced locally. What do we learn from the chemistry of the slag inclusions? Is the chemical fingerprint of the Dutch ore sufficiently different from ores from Germany, Belgium and France?

## 15 NEUTRON TECHNIQUES AND THE ANALYSIS OF ARMS AND ARMOUR

**Abstract author(s):** Williams, Alan - Edge, David (The Wallace Collection) - Grazzi, Francesco (CNR Italy) - Scherillo, Antonella (ISIS Neutron Source, Harwell) - Rosta, Laszlo - Kali, Gyorgi - Kasztovsky, Zsolt (Budapest Nuclear Centre)

**Abstract format:** Oral

Traditional metallography is well-suited to the analysis of plate armour, and is micro-invasive. However, it is less suitable for swords, because their constructional details are only apparent when viewed in section. Neutron diffraction is proving to be a valuable method for their analysis.

One of our aims is the detailed study of the Oriental Arms and Armour of the Wallace Collection which contains nearly one thousand items and is one of the most important collections of Indian arms and armour outside the subcontinent.

In the collection, there are approximately 200 swords, 50 helmets and 50 shields of princely quality, and it is fundamental that any analyses are performed on non-invasive basis.

Many of these objects were made of crucible steel (a high C% cast steel) of which an unknown proportion were made of wootz (the so-called “Damascus steel”) which was very slowly cooled and very carefully forged so as to preserve a surface pattern which was highly esteemed as a visible indicator of the artefact’s metallurgy. Unfortunately many Victorian collectors and dealers (from whom Sir Richard Wallace purchased much of his arms and armour collection) over-polished them because they did not appreciate the reasons for their dark silver-grey appearance.

Neutron diffraction can determine the relative concentrations of ferrite, cementite, and other phases, and as well as phase analysis, show anisotropy in the distribution of the cementite. So crucible steels can be identified, and hidden patterns within them can be detected, thus informing ethical decisions about restoration.

Additionally, apparent changes in the texture of cementite is related to the thermal history of their manufacture.

## 16 PARTICIPATION OF THE BUDAPEST NEUTRON CENTRE IN THE EUROPEAN HERITAGE SCIENCE PROJECTS

**Abstract author(s):** Kasztovszky, Zsolt (Centre for Energy Research)

**Abstract format:** Oral

Scientific research of our tangible cultural heritage – i.e. Heritage Science – stands in the front of the European research, also belongs to the H2020 Grand Challenge priorities.

The European Community has launched the first Heritage Science thematic project in 2001, called LABS TECH with 11 participants. In the 6th Framework Program, there was a continuation called EU-ARTECH, with Italy, Greece, UK and Germany. The major task was to provide trans-national access to large facilities and mobile instruments and expertise offered.

Budapest Neutron Centre successfully took part in NMI3 projects of the 5th, 6th and 7th Framework Program, offering access to neutron-based instruments. Most of the research proposals to the PGAA instrument used to belong to the heritage science discipline.

Between 2006 and 2010, our PGAA laboratory took part in the ANCIENT CHARM project, aimed to develop a new technique called PGAI-NT, which is already used routinely since then.

In 2009, the BNC was invited to CHARISMA project (2009-2014), as the sole fixlab provider offering neutron methods. A continuation of the project, was IPERION CH (2015-2019). At last, IPERION HS will start in 2020 with the participation of 21 European

countries and the USA. In this project, every country is represented by national hubs. Hungary is represented by the Atomki, to which the Centre of Energy Research is linked, as a “third party”.

Since 2016, the European Research Infrastructure for Heritage Science (E-RIHS) preparatory project takes place on the “ESFRI Roadmap”. The aim of E-RIHS is to ensure integrated, in-kind, sustainable access for heritage scientists to the leading European research centres. Hungary is represented by the Atomki at E-RIHS, with linked third parties of the EK, Wigner and the Hungarian National Museum. The final aim of these networking is to create national centres of heritage science in Europe.

## a. APPLICATION OF CFE-SEM-EDX AND OPTICAL MICROSCOPY TO NEOLITHIC SILICEOUS TOOLS FROM ȘOIMUȘ-TELEGHI SITE (HUNEDOARA COUNTY, ROMANIA)

**Abstract author(s):** Rey, Mar (Babes-Bolyai University, Department of Geology, Cluj-Napoca; University of Barcelona, Faculty of Geography and History, Department of History and Archaeology, Section of Prehistory and Archaeology - SERP, Barcelona) - Ionescu, Corina (Babes-Bolyai University, Department of Geology, Cluj-Napoca; Kazan Federal University, Archeotechnologies & Archeological Material Sciences Lab., Tatarstan) - Barbat, Ioan Alexandru (Museum of the Dacian and Roman Civilisation, Deva) - Barbu-Tudoran, Lucian (Babeș-Bolyai University, Department of Biology, Cluj-Napoca)

**Abstract format:** Poster

Șoimuș-Teleghi (Șoimuș village in Hunedoara County, Romania) is an Early Neolithic settlement dated between the end of the 7th millennium BC to the beginning of the 2nd millennium AD. In 2011, preventive archaeology surveys were conducted by several Romanian institutions, as The Museum of Dacian and Roman Civilization (Deva), the “Vasile Pârvan” Institute of Archaeology and the National Museum of Romanian History (both in Bucharest), within the “Deva-Orăștie Highway project (south-western Transylvania)”.

The present archaeometric study focuses on the siliceous lithic industry, a total of 43 samples (tools and débitage) dated to the Starčevo-Criș cultural complex. The methodology included the analysis of 14 samples by optical microscopy (OM) and from that, 8 selected pieces were also analysed by cold field emission scanning electron microscopy coupled with energy dispersive X-ray spectroscopy (CFE-SEM-EDX). The aim of the study is to characterize and classify the lithic tools based on their compositional and microstructural features, in order to finally infer the source(s) of the raw materials.

Several petrographic types have been defined, including radiolarite, chert, fossiliferous chert, siliceous limestone, jasper and chalcedony. CFE-SEM-EDX shows particular microtextural and compositional characteristics for each group, endowing their own singularity.

The results show the great variability of the manufactured siliceous rocks and demonstrate that the prehistoric communities knew well the lithic sources in their environment.

The mineralogical and petrographic composition as well and the microstructural and microtextural evidence open a gate to future provenancing studies and therefore a better understanding of past human behaviour.

Acknowledgement. M. R.-S. acknowledges the support of the Romanian Ministry of Research and Innovation (UEFISCDI/CNCSIS project PN-III-P1-1.1-PD-2016-0859).

## b. APPLICATION OF NEUTRON-BASED METHODS IN PROVENANCE RESEARCH OF LITHIC ARCHAEOLOGICAL MATERIAL

**Abstract author(s):** Kasztovszky, Zsolt (Centre for Energy Research) - Biró, Katalin (Hungarian National Museum)

**Abstract format:** Poster

Neutrons can easily penetrate through deeper layers of the investigated objects. When irradiating the samples, elemental or isotopic composition can be determined by the detection of emitted characteristic radiation. While conventional Neutron Activation Analysis (NAA) requires sampling, external guided neutron beams of low intensity provide an excellent tool to study intact archaeological objects without any damage.

Considering lithic artefacts, which have a well-defined, constant chemical composition over long historical times, it is promising to perform provenance studies on them, using non-destructive methods.

Using the bulk major-, minor- and trace elements data of the archaeological objects and those of the comparative raw materials, one can have a chance to identify the possible raw-material sources. At the PGAA laboratory of the Budapest Neutron Centre, we perform provenance research on archaeological objects made of various kinds of rocks for more than 20 years. We co-operate with the Hungarian National Museum, and with other Hungarian and foreign museums. The Lithotheca of the Hungarian National Museum provides reference material for our studies.

Our obsidian database contains data of around 500 archaeological pieces mostly from Europe and also geological reference material from the most important sources. Fortunately, significant fingerprinting major and trace elements were found applicable to differentiate between the main sources. Case studies of Croatian, Serbian and Romanian archaeological obsidian are presented.

Another successful project aims to identify possible geological outcrops of polished stone tools made of metamorphic rocks (greenschist, blueschist, hornfels, etc.) within the Carpathian Basin and its immediate surroundings.

Provenance study of silex, a very high silica-content raw material of chipped stone tools is much more difficult, due to the relatively low amount of diagnostic elements and the similarity of different kinds of silex (i.e. flint, radiolarite, chert, etc.) in their composition.

- However, an attempt to distinguish between the silex categories is shown.
- c.

PRELIMINARY REPORT OF THE ANALYSES OF THE GARNET JEWELLERY FROM THE FINDS IN BOHEMIA FROM THE MIGRATION PERIOD

**Abstract author(s):** Jirík, Jaroslav (Institute of Archaeology, Faculty of Arts, Charles University in Prague) - Calligaro, Thomas (Centre de Recherche et de Restauration des Musées de France) - Tisucká, Marika (National Museum, Prague) - Daněček, David (Středočeské muzeum v Roztokách u Prahy)

**Abstract format:** Poster

Recent discoveries of the presence of the Bohemian garnets (pyropes) as inlays of the cloisonné jewellery of the Mediterranean origin, found in the famous grave of the Frankish king Childeric of Tournai, and also in princely grave in Apahida in Transylvania, open an important question of the origin, organization of prospection and exploration, distribution of these famous semiprecious stones during the Late Antiquity. An idea to bring an independent proof of the exploration of the Bohemian garnets during the Migration Period was at the beginning of the research project entitled "Bohemian Garnet and the Early Merovingian Period : Quest for the Origin of the Famous Jewellery Production", which was realized using Accelerator-based analytical techniques in Centre de Recherche et de Restauration des Musées de France in Paris. For the case study the examples of the garnet jewellery (fibulae, pendants, fitting of the scabbard of a dagger) from the collections of the National Museum in Prague and Středočeské muzeum in Roztoky were chosen. The results show supra-regional contacts of Bohemia and there settled jewellery ateliers. On the other hand for the chronology of the occurrence of the Bohemian garnets in Mediterranean should be precised and several alternative explanations can be offered.

213	<div><div>MULTIDISCIPLINARY APPROACH TO THE STUDY OF ENGRAVED ART</div><div><b>Theme:</b> 5. Theories and methods in archaeology: interactions between disciplines</div><div><b>Organisers:</b> Basile, Martina (Sapienza, University of Rome; University of Valencia) - López-Tascón, Cristina (University of Oviedo)</div><div><b>Format:</b> Regular session</div><div>Engraved art represents one of the most interesting aspects of the prehistoric artistic view, in that, through figurative and abstract representations, the artist’s ability to transform the material available is shown. The engravings are made on supports that can be mobile or</div><div>rupestrian with the addition or not of coloring. The execution of the lines can be done with multiple working tools and sometimes anticipated by the processing of the surface. The set of actions carried out to create the engraved artistic representation (the chaîne opératoire) can vary according to the geographical and chronological context, the support used or the work tool. The methods applied to study the art of engraving over the years have changed from a simple formal analysis to the recent multidisciplinary approaches, which through the combination of new technologies and new digital perspectives offer interesting ideas for understanding the chaîne opératoire.</div><div>In this session we invite scholars to present communications that promote the studies about new digital imaging to analyse and record documentation engravings, tools to do them and methods to preparing engraved surfaces, all in different kind of supports (caves’ wall, pebbles, bones, etc). The comparison between the different methods of</div><div>investigation on the engraved art, as well as the presence of multiple geographical and chronological contexts, can be useful to generate new ideas for reflection on this theme.</div></div>
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ABSTRACTS

- 1

METHODS OF DIGITAL DOCUMENTATION AND REPRESENTATION OF ROCK ART

**Abstract author(s):** Pankina, Anna - Kazakov, Vladislav (Novosibirsk State University)

**Abstract format:** Oral

The documentation and publication of rock art plays a key role in the processes of their conservation and subsequent study. Despite significant technological progress in the field of digital representation of visual materials, the methods of documenting and publishing petroglyphs have evolved poorly.

As part of the work carried out at Novosibirsk State University, rock art of South Siberia is being documented, including photographing rock panels and building their 3D-models using SfM-photogrammetry.

However, most of the studied petroglyphs, both painted and engraved, are now so faded that without special techniques they are not visible in photos and 3D-images. To solve this problem, the team of artemiris.org project has developed and applies a number of techniques for the processing and cognitive representation of these ancient drawings.

So, a semi-automatic method based on relief is used to construct a drawing of relief petroglyphs. In cases where this is not possible, drawing is done manually on top of the substrate layer based on the original photo image. In the case of colored drawings, a substrate based on DStretch processing of the original image is also used. For the best cognitive perception, the resulting drawings are also superimposed on top of the original layer to represent the pseudo-image of the plane with bright illumination of the ancient drawing.

- The same approach is used for painting textures of three-dimensional models.
- Also when a pseudo-image or a three-dimensional model of palimpsest is published, the chronological layers are drawn in different colors and can be disabled according to the user’s choice. In the same way the user, by manipulating the layers, is able to virtually clean the lichen, remove cracks, lighten traces of the tool or improve the color of the paint.
- This work was supported by the RSF project 18-78-10079.
- 2

GROTTA ROMANELLI ENGRAVED ART: PRELIMINARY OBSERVATIONS ON THE DECORATED LIMESTONE PLAQUETTES

**Abstract author(s):** Zampetti, Daniela (Sapienza University of Rome; Istituto Italiano di Paleontologia Umana ISIPU) - Basile, Martina (Sapienza University of Rome) - Repola, Leopoldo (Suor Orsola Benincasa University of Naples)

**Abstract format:** Oral

The mobilier art of Grotta Romanelli (Lecce-Apulia), going back to the end of the Upper Palaeolithic (Final Epigravettian), includes a rich repertoire of engraved plaquettes retrieved during the excavations carried out in the last century. The pieces, sometimes fragmentary, outnumber one hundred and several are still unpublished. Most of the subjects are abstract motifs but there are also zoomorphic figures (Acanfora 1967). Use-wear traces, under study, are evident on the edges of some pieces; these features suggest a series of hypotheses on the possible functions of the artefacts through time. The contribution here presented highlights the ongoing research both on the post-depositional alterations of the plaquettes surfaces and on the engraving technology. More in particular have been selected two plaquettes, decorated with zoomorphic figures, which show interesting details on the engraving technique and on the peculiar use of the surface of the limestone supports to draw the images. The intersection of the microscope analyses with the 3D modelling reveals that the engraved traits are sometimes superposed and that there can be a number of figures almost invisible without the synergy of different approaches.
- 3

THE VENUSES OF PARABITA (LECCE, APULIA) : FOR A RECONSTRUCTION OF THE PREHISTORIC ARTISTIC GESTURE

**Abstract author(s):** Basile, Martina (Sapienza University of Rome, University of Valencia) - Lemorini, Cristina - Zampetti, Daniela (Sapienza University of Rome) - Repola, Leopoldo (Suor Orsola Benincasa University of Naples)

**Abstract format:** Oral

The so-called “Venuses of Parabita” represent one of the most interesting aspects in the panorama of the Italian Palaeolithic art. The two bone figurines were found in 1966 at the ‘Nicola Fazzu’ Cave in the territoryof Parabita; their importance was immediately understood so that since then the site took the name of Grotta delle Veneri. In this research project we attempted to reconstruct the sequence of actions and gestures that led to their creation, through the use of two integrated methodologies: experimental archaeology and the analysis of technological traces. Experimental archaeology is a method based on the verification of archaeological hypotheses through the development of experimental protocols. The traces are the imprints that tools, actions and gestures leave above the processed material. The laboratory replication of actions and gestures through materials similar to the archaeological context allows interesting evaluations of past cultures. For the analysis of Venus, an experimental protocol was applied, which involved the observation of the figurines under the microscope, their experimental replication using materials similar to the archaeological context and the comparison between experimental and archaeological traces. The technological traces were also investigated through 3D technology. The three-dimensional vision of the traces allows their evaluation at 360 degrees as it takes into account the geometric characteristics of the worked surface. The combined analysis between experimental archaeology, traces analysis and 3D reproduction has produced interesting results about the operational sequence that led to the realization of the Venuses.

- 4

THE ENGRAVED LATEGLACIAL ROCK AND MOBILE ART OF SICILY (ITALY): THE CURRENT STATE OF RESEARCH

**Abstract author(s):** Di Maida, Gianpiero (Neanderthal Museum)

**Abstract format:** Oral

Sicily hosts one of the most relevant rock and mobile art record of Europe, outside the classic Franco-Cantabrian area. With the exception of few single pictograms, the quasi-totality of this record is engraved, either on the rock walls of caves and shelters or on mobile supports. This complex of figures has been recently totally reviewed (Di Maida in press) and contextually also re-documented with digital method of recording (Di Maida 2016 and in press).

The present paper will firstly present the record in its outline, its chronological attribution and relative issues, and its placement within the macro-regional area; secondly, it will briefly report the used methods of recording and analyses applied, and address their pros and cons in the given case-study; finally, it will shortly give an overview of the next steps and development of future research.

References
  - Di Maida, G., 2016. 3D in the cave: Hey young deer, why the long face (and no tail)? Rock Art Research 33, 209-218.
  - Di Maida, G., in press. «Marks on the rocks. Rock and mobile art as expression of the hunter–gatherers’ groups Weltanschauung in the Sicilian landscape from Lateglacial to Early Holocene». Dr. R. Habelt Verlag, Bonn.

5	<p><b>ENGRAVING LIMESTONE ROCKS: EXPERIMENTAL AND USE-WEAR ANALYSIS APPROACH</b></p> <p><b>Abstract author(s):</b> López-Tascón, Cristina (Universidad de Oviedo)</p> <p><b>Abstract format:</b> Oral</p> <p>Engraved Palaeolithic parietal art in Asturias (North of Spain) is located in caves and rock shelters formed by limestone rocks. Traditional interpretations have been mainly focused on both typological and stylistic approaches, and on the analysis of formal aspects and motifs engraved.</p> <p>In this communication I present a study about the experimental reproduction of engravings. The rock selected was Caliza de Montaña, rock present in the walls of most part of art sites situated spread along the Nalón river (central area of Asturias). Experimentation allow to check the hardness of rock, some techniques to reproduce the engravings, the sections produced, and different tools and raw material (flint and quartzite) employed to engrave. Also, this study presents a traceological approach to analyse experimental tools used in the reproduction of parietal limestone engravings. The main objective consists in checking if these lithics tools present use-wear traces and if it is possible to characterise and define it.</p>
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6	<p><b>THE HOLISTIC APPROACH TO THE CARRIBEAN ROCK ART STUDIES</b></p> <p><b>Abstract author(s):</b> Juszczuk, Karolina (University of Warsaw)</p> <p><b>Abstract format:</b> Oral</p> <p>Rock art studies are varied and their realizations are made up of many variables that determine which methods and tools can be used. However, the biggest difficulty is to explain what message, meaning, and purpose for their authors had engraved and painted representations. To explore such a complex issue, a wide range of tools should be used, both those that will show us the technical aspects of creating rock art and those that will help to understand the meaning of the representations themselves. In my presentation, I will present a multidisciplinary approach used in my research of pre-colonial rock art in the Carabobo region of northern Venezuela. Until now, researchers from this region have focused on interpreting individual rock art representations. The aim of my research is to determine whether rock art from this region could serve as a graphic communication system (GCS) within or between local Carib- and Arawak-speaking groups who lived in this area. In my research, I use both traditional formal methods, iconographical analyses, as well as spatial analyses using the GIS (Geographical Information System), digital analyses, archival and historical studies about this subject and GCS approach that bases on the theory of sign and theory of writing, as also the cognitive linguistics studies. The combination of all these methods and tools help me to distinguish the particular key-signs that are engraved in the whole rock art repository from that region, and also allows me to analyze the spatial distribution and relationship among the particular signs. In effect, it is the first step to know if there were kind of code in the rock signs from that region that could have created the meaning.</p>
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215	<p><b>NETWORKS OF INTERACTION AND COMMUNICATION: PATTERNS OF EMERGING COMPLEXITY</b></p> <p><b>Theme:</b> 1. Networks, networking, communication: archaeology of interactions</p> <p><b>Organisers:</b> Schlicht, Jan-Eric (Institut für Ur- und Frühgeschichte, Kiel University) - Diachenko, Aleksandr (National Academy of Sciences of Ukraine, Institute of Archaeology)</p> <p><b>Format:</b> Regular session</p> <p>Providing a new explanatory framework for numerous ‘old’ archaeological issues, complex systems and complex dynamic behavior became increasingly prominent topics in current archaeological discourse. While depending on initial conditions, scale-free properties of a number of complex systems demonstrate that for an understanding of the development of human organization and culture it is necessary to refocus from ‘challenge – respond’ patterns to the systems’ internal driven forces. Therefore, behavior of complex dynamic systems, which by definition exceeds the sum of the behavior of their integral parts, may be approached through the analysis of communication/interaction networks. For doing so, it is not only necessary to develop sound and innovative methodologies, but also to reflect and integrate various practical application-driven research perspectives with reflective and innovative theoretical thought. We believe complexity, complex systems and complex dynamic behavior to offer excellent grounds for new and integrative prospects in archaeological research.</p> <p>In this session we aim to explore various theoretical and methodological approaches to complexity in archaeology from prehistory to more recent times. The session especially aims to discuss the complex networks and interaction/communication paths to evolving complexity. We encourage contributions to the following issues:</p> <ul style="list-style-type: none"> <li>Behavioral patterns produced by interaction/communication networks;</li> <li>Description and modeling of complex dynamic behavior;</li> <li>Distinction between external and internal driven forces in systems behavior;</li> <li>Approaching cycles in development of complex systems;</li> <li>Theoretical contribution of complexity to archaeological method and theory.</li> </ul> <p>Papers dealing with related, but not listed issues, are highly welcome as well.</p>
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ABSTRACTS

1	<p><b>TWO DIFFERENT LOGICS? QUESTIONS OF ONTOLOGY AND HOLISM IN THE FACE OF SYSTEMS-REPRESENTATIONS AND INFERENCE IN ARCHAEOLOGY</b></p> <p><b>Abstract author(s):</b> Schlicht, Jan-Eric (Kiel University)</p> <p><b>Abstract format:</b> Oral</p> <p>Three different notions stemming from (old and recent) discussions on archaeological/anthropological and social theory form the basis for this paper:</p> <ul style="list-style-type: none"> <li>The notion of societies being complex dynamic systems, producing complex dynamic behaviour that is to be modelled through quantitative means.</li> <li>Increasingly prominent approaches to regarding human life, culture, identity, action, etc. as products of highly inter-laced strands of interaction, as for example with the concept of Transculturality.</li> <li>The debate around “posthumanist” concepts, that seek to dissolve the borders between human and non-human and aim to redefine the ways humanities and social sciences should approach the questions of intentionality and action.</li> </ul> <p>With these three aspects in mind the main questions of those lines of thought boil down to a point of friction between two apparently different logics: The metaphysical relations of volition and agency within a state of affairs from within the human perspective itself and the systemic interactions of everything that is, was and will be, given a holistic perspective of an ontology derived from the notion of the universe being made up of systems with varying levels of complexity. In short, this contribution aims to provide some thought on the possibilities and constraints of integrating these two logics as well as consequently appearing questions regarding the possible inference we may gain from modelling complexity.</p>
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2	<p><b>INITIATION RITES DURING THE AUSTRONESIAN DISPERSAL</b></p> <p><b>Abstract author(s):</b> O'Brien, Michael (Texas A&amp;M–San Antonio)</p> <p><b>Abstract format:</b> Oral</p> <p>Kinship systems, flexible through time, were integral to the evolution of complex societies, directing modes of cooperation and interactions with other cultures, which in turn affected the potential for intergenerational wealth transmission, with further effects on subsistence, specialization, and power relations. Kin-based authority was the earliest form of resource control underlying the emergence of wealth inequality. An intermediate link between kinship system and inequality could be initiation rites. Here we explore the co-evolution of initiation rites and kinship systems in early Austronesian societies, whose putative matrilineal origins contrast with the patriliney–patrilocality in most other early agricultural societies worldwide. Previous work used phylogenetic comparative methods and ethnolinguistic information to infer matrilineal residence in proto-Austronesian societies. We build on this work through Bayesian phylogenetic analysis of the correspondence among initiation rites, marital residence, and the linguistic-population history of proto-Austronesian societies. Data on initiation rites were collected using not only Murdock’s (1967) Ethnographic Atlas but also a multitude of primary sources, mainly by close reading of ethnographies. These data on modern initiation rites were then used as characters to estimate initiation rites in ancestral Austronesian societies, similar to previous analyses on marital residence, socio-political organization, and human sacrificial rites in those societies.</p>
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3	<p><b>CAPTAIN: WHAT WE’VE GOT HERE IS FAILURE TO COMMUNICATE</b></p> <p><b>Abstract author(s):</b> Zubrow, Ezra (Universities of Toronto and Buffalo)</p> <p><b>Abstract format:</b> Oral</p> <p>Archaeologists love talking about networks –communication networks, social networks, hunting networks, and transport networks to name only a few. New software applications make the analysis of complex social networks easy. Research on network dynamics has demonstrated their multifaceted nature as communication systems. The network form of organization is held together by many kinds of relations that allow for dynamic, emergent, adaptive, and flexible associations. Networks are made up of nodes and communication links and are often composed of smaller networks.</p> <p>This paper takes a reverse approach. It asks two simple questions. First, what is necessary for a network to fail and second, is there something inherent in the cyclical nature of increasingly complex networks that make failure an inevitable conclusion. Network meshes are systematically zeroed out in stages to determine the failure points. Cyclical reconstructions allow some of the holes in the network to be patched at differential rates in the attempt to see whether there is an inevitable conclusion.</p> <p>After answering these two questions, it examines what inevitable network failure might mean in the archaeological record with substantive examples taken from the Old World.</p> <p>The title is from the movie “Cool Hand Luke”</p>
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- 4

SOCIAL COHESION CYCLES IN TEMPERATE EUROPEAN NEOLITHIC AND MODERN SOCIETIES

**Abstract author(s):** Gronenborn, Detlef (Roemisch-Germanisches Zentralmuseum)

**Abstract format:** Oral

Fluctuations in social cohesion as an active internal forcing are investigated both for early farming as well as modern societies in Temperate Europe. We postulate that these internal processes have – at least from the onset of farming onwards – constituted a considerable if not decisive forcing agent in long-term trajectories.

We try to discuss the concepts of social cohesion and its applicability in archaeology. We discuss further what material and immaterial remains may serve as quantifiable indicators focussing specifically on ceramic decoration for early farming societies. Relating to the theoretical discussion we search for and apply proxy data from Modernity which might have a similar explanatory value.

As will be shown, both early farming as well as modern industrial and post-industrial societies underwent cyclical fluctuations in social cohesion which are possibly decoupled from any other parameters. Therefore, social cohesion cycles might constitute an independent forcing agent in historic processes, at least as from the onset of farming onwards.
- 5

CYCLICAL BEHAVIOR OF PREHISTORIC CULTURAL SYSTEMS WITH STABLE INFORMATIONAL CAPACITY

**Abstract author(s):** Diachenko, Aleksandr (National Academy of Sciences of Ukraine, Institute of Archaeology) - Sobkowiak-Tabaka, Iwona (Polish Academy of Sciences, Institute of Archaeology and Ethnology)

**Abstract format:** Oral

Since the great thinkers of Ancient Greece till the German classical philosophy and Marxism human thought concerned cyclical behavior of our history and its driving factors. These great ideas continuously influence various fields of science, including archaeology and anthropology. Most recent research in these disciplines mainly focuses on cycles in the development of material culture in frames of resilience and vulnerability. Grounded on complexity theory, our paper aims to analyze the internal driving forces of cultural systems causing their repeated stability and change.

This study aims to analyze the cyclical behavior in a certain class of prehistoric cultural systems, the ones characterized by stable informational capacity (or cultural systems remained by populations which were not passing through significant social and economic transformations). First, we will briefly discuss the quantitative approach to the categories of ‘diversity’ and ‘uniformity’ in archaeological record. Second, we will present the model of cyclical cultural behavior from ‘uniformity’ to ‘diversity’ and back to ‘uniformity’. Third, we will discuss the outcomes of our model and its possible impact on archaeological method and theory.
- 6

MODELLING SURVIVAL IN EARLY FARMING SETTLEMENTS IN THE NORTH-EASTERN IBERIAN PENINSULA

**Abstract author(s):** Palacios, Olga - Barceló, Juan Antonio (Autonomous University of Barcelona)

**Abstract format:** Oral

Difficulties surrounding the identification of social systems in prehistoric communities has propitiated the development of multiple social theories and a variety of approaches to interpret the archaeological remains. The Bayesian Belief Network mathematical methodology has proved to be a crucial tool to model uncertainty and probability to predict parameters’ consequences, even when some data entries are missing. This communication has the principal objective to present a research proposal centered on exploring what sort of mechanisms were probably employed by early farmers living in the north-eastern Iberian Peninsula (ca. 5500 - 4500 BC approximately) to guarantee their survival, taking into account the actual archaeological record as a priori information.

We present a hypothetical probabilistic model of survival in the historical conditions of early farming in the Western Mediterranean. The model integrates environmental variables and social and economic parameters considered essential to produce and reproduce subsistence practices. Recent research carried on environmental studies have previously defined several variables relevant for soil productivity in husbandry practices offering relevant insights into potential long-term consequences of management practices. The proposed model represents an exploratory study integrating previous studies from environmental disciplines and economic anthropology with the archaeological record. Our ultimate goal is to understand better how subsistence practices were conducted in Mediterranean Neolithic and analyse long-term communities’ survival. Bayesian Belief networks are used to simulate probable values for different parameters taking into account both theoretical deductions and available archaeological data. Of paramount importance in our model is not only the estimation of parameter values, but the specific probabilistic causal modelling of parameter relationships, making emphasis on the particular relationship between environmental and social variables. The ultimate outcome will be to evaluate how optimization of productive subsistence practices would have been possible and offering new understanding into socioeconomic and technological systems of early farming societies.
- 7

BEHAVIOURS AND KNOW HOW DYNAMICS FROM EASTERN SICILY LATE UPPER PALEOLITHIC AND MESOLITHIC SITES: A MICROSCOPIC HOLISTIC APPROACH

**Abstract author(s):** Iovino, Maria Rosa (Istituto Italiano Paleontologia Umana)

**Abstract format:** Oral

The analysis of prehistoric material culture helps to understand past subsistence and socio- economic strategies adopted by past

- 8

RECONSTRUCTING MESOLITHIC SOCIAL NETWORKS FROM THE IBERIAN PENINSULA USING ORNAMENTS

**Abstract author(s):** Cucart-Mora, Carolina - Romano, Valeria (Instituto Universitario de Investigación en Arqueología y Patrimonio Histórico - INAPH, Universidad de Alicante) - Lozano, Sergi (Departament d'Història Econòmica, Institucions, Política i Economia Mundial, Universitat de Barcelona) - Gómez-Puche, Magdalena - Fernández López de Pablo, Javier (Instituto Universitario de Investigación en Arqueología y Patrimonio Histórico - INAPH, Universidad de Alicante)

**Abstract format:** Oral

For a long time, archaeologists have observed the interactions among hunter-gatherers’ populations embedded in the movement of raw materials and objects found far from their original sources. The social network, the structure constituted by those interactions, is a well-established concept in archaeology to estimate connectivity among hunter-gatherers’ populations. However, the heuristic power of the social network approach has not been fully exploited because of the limited amount of case studies where a formal social network analysis (i.e. SNA) has been applied. This contribution belongs to the work developed within the Paleodem (ERC-GoG-2015 Ref.683018) project which aims at studying cultural transmission processes during the Late Glacial and Post-Glacial periods in Iberia. We present the preliminary results from a case study where SNA is used to formally model the interactions among hunter-gatherers from the Iberian Peninsula throughout the early Holocene. Our proxy for social interactions is ornaments, as they are an accepted marker of non-“utilitarian” mobility and exchange between hunter-gatherers. We use matrices of similarity based on the ornaments assemblage to create two weighted networks: one corresponding to the early Mesolithic and the other to the late Mesolithic. Finally, we characterize these networks in terms of their macro- and microscopic structural features and compare them. We argue that a greater knowledge of Mesolithic hunter-gatherers’ social networks will contribute to a better understanding of the mechanisms behind the significant cultural change documented in the Iberian Peninsula during the early Holocene.
- 9

NETWORKS IN THE THIRD MILLENNIUM BC IN THE IBERIAN PENINSULA

**Abstract author(s):** Jiménez-Puerto, Joaquín R - Bernabeu Aubán, Joan (Departamento de Prehistoria, Arqueología e Historia Antigua de la UVEG)

**Abstract format:** Oral

The word “network” is a mere metaphor to reflect the idea of connectivity. The Science of Complex Networks ended up being a very useful tool in archaeology to study the variability in material culture through space-time. This variation is an emerging phenomenon which results from collective-individual interactions, whose spatial structure follows that of complex networks with a geographic component. Following an evolutionary perspective it will be considered an expression of the interactions between its components. This interaction between cultural groups will be addressed through the variation of the patterns of material culture, which are an emergent expression of the interplay between cultural groups. The tools provided by Social Network Analysis (SNA) will be specially suitable for this task. Specifically, the study of the network structure and the relevance of the nodes conforming it, could be correlated with the mentioned variation, due to the control they exert upon the network information flow.

The goal of this work is the application of some methods typical of SNA, to the problematic associated with the Iberian IIIrd millennium BC. In our case, some methods will be addressed to characterize the formation of archaeological entities and the cycles of growing-fragmentation, that can be visible through the archaeological record, in the framework of the IIIrd millennium’s Iberian oriental coast.

Therefore, in order to observe the diachronic evolutionary dynamics of the networks, a separation in time windows will be implemented. The radiocarbon series available for the area will be needed to guarantee the synchronicity with the analyzed stratigraphic contexts. Using these temporal frameworks, will allow us to analyze the traits of some material culture items, in order to establish the relationships between the different archaeological contexts. Those relationships will be laid down using standardized similarity criteria, and will permit to study the interplay between different cultural regions.
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EXPLORING ROOTEDNESS AS A SOCIAL STRATEGY FOR CULTIVATING FAR-REACHING NETWORKS: RE-EXAMINING ØLBY WOMAN AS A “LOKALE FRAU”

**Abstract author(s):** Reiter, Samantha - Frei, Karin (National Museum of Denmark) - Nørgaard, Heide (University of Aarhus) - Kaul, Flemming (National Museum of Denmark)

**Abstract format:** Oral

The results of a recent study on the Nordic Bronze Age Period II (1500-1300 BC) elite oak coffin burial known as the Ølby Woman

suggest that, while Ølby Woman may have lived locally within Denmark during her lifetime, she was nonetheless buried with objects which represented many different parts of the Bronze Age World. This paper presents the results of the provenance investigations conducted on Ølby Woman's dental enamel, bronze neck collar, sword/dagger and belt plate and contrasts that data with a discussion of the results of previous results regarding her blue glass bead. This body of data is then juxtaposed with the recent and ever-increasing amount of studies investigating human mobility during the European Bronze Age. Finally, the paper turns to spatial containment theory and Gilbert's concept of "rootedness" in order to explore how the cultivation of local networks may have been a specific strategy for coalescing social power and, furthermore, how that power may have led to far-reaching networks of interaction and communication in the Bronze Age World.

11 NETWORK CENTRALITY IN A DECENTRALIZED NETWORK:THE CASE OF THE CENTRAL ALPINE AREA IN THE MIDDLE BRONZE AND EARLY IRON AGES

**Abstract author(s):** Brunner, Mirco (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCCR; Christian-Albrechts Universität zu Kiel, Graduate School «Human Development in Landscapes») - Ballmer, Ariane (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCCR)

**Abstract format:** Oral

The central Alpine area (cantons of St Gallen, Grisons and Ticino/Switzerland, Tyrol/Austria, South Tyrol and Trentino/Italy) has proven to have served as a transalpine traffic route since prehistoric times, with a significant increase from the MBA on. The finds and even people point to an increasingly structured and established network of contacts and exchange favored by the topographical bottleneck situation. Meanwhile, the degree of organization behind the mobility of people, objects and ideas is unknown, yet, an adequate infrastructure and knowledge must be expected.

Interestingly enough, within this active exchange network, the LBA and EIA settlement topography does display a strikingly decentralized, barely hierarchical quality, lacking of so-called 'central places', unlike for instance the adjacent areas north and south of the Alps. Indeed, in the Alps, an increased organization of space is occurring at the transition from the LBA to the EIA, especially expressed in the emergence of sanctuaries and a significant interaction network density. However, 'central places' featuring prominent terrain situations, impressive defensive fortifications, luxury products, imported goods from the Mediterranean, workshops and active crafting activity, as well as accompanying rich graves are suspiciously absent in the area of interest. This puts a question mark behind the assumed presence of ruling settlements, 'elites' or other territory controlling instances, and their degree of power and influence as well as their identity.

This paper discusses the particular case of the Central Alps as an economic space and settlement landscape in regards to its role as long distance exchange channel within a wider contact network. Multilevel approaches are taken into consideration to question the dimensions of 'centrality', or 'decentrality' in this very specific topography.

218 ARCHAEOLOGY IN 3D – NEW TECHNOLOGIES FOR OLD QUESTIONS. PART 1

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Patay-Horváth, András (Archaeological Institute of the Hungarian Academy of Sciences) - Hermon, Sorin (Cyprus Institute, STARC) - Jerem, Erzsébet (Archaeolingua Foundation)

**Format:** Regular session

The increasing availability of 3D datasets produced by photogrammetry, laser scanning, and procedural modelling in the last decades have offered new opportunities for the recording, documentation and scientific visualization of archaeological sites, environments and artefacts. Still debatable are their overall contribution to grand challenges in archaeology or the clarification of old puzzles which engaged generations of archaeologists so far. Analyses that would explicitly aim to do this remain few and far between, despite often producing promising but at the same time inconclusive results. Since the impact of the new technologies will largely depend on the long run on the successful combination of old problems and new methodologies, the proposed session would like to invite scholars with an interdisciplinary interest in archaeology, architecture, material culture, cultural heritage, computer graphics, morphometrics, machine learning etc. to present works that demonstrate how 3D datasets actually contribute to elucidate classical problems of archaeological research. We welcome presentations focusing on quantitative analysis of SFM and 3D models of archaeological artefacts and spaces, formal visibility, acoustic and lighting analysis of archaeological environments, analyses of immersive VR experiences (e.g. via the use of eye tracking devices etc.), 3D GIS analysis, volumetric, structural and statistical analysis of 3D data and scientific visualisation of sites, environments or artefacts, participants being encouraged to critically evaluate any methodological and theoretical issues related to these approaches.

ABSTRACTS

1 3D APPROACHES TO THE DOCUMENTATION OF WEAR TRACES ON EARLY NEANDERTHALS WOODEN ARTEFACTS FROM POGGETTI VECCHI, ITALY

**Abstract author(s):** Florindi, Silvia (Cyprus Institute - STARC; Istituto Italiano di Preistoria e Protostoria) - Aranguren, Biancamaria (Soprintendenza ABAP Siena - Grosseto - Arezzo) - Grimaldi, Stefano (Università degli Studi di Trento) - Hermon, Sorin - Polig, Martina (Cyprus Institute - STARC) - Santaniello, Fabio (Università degli Studi di Trento) - Revedin, Anna (Istituto Italiano di Preistoria e Protostoria)

**Abstract format:** Oral

The discovery of the Poggetti Vecchi site (Grosseto) in 2012 opened the way to study more in detail the material culture and the cognitive capabilities of the first Neanderthal groups which inhabited western Italy during the late Middle Pleistocene. Indeed, wooden tools showing traces of interaction with fire have been found at the site highlighting the artisanal skills of these hominins. These wooden tools have been broadly interpreted as digging sticks, a multipurpose tool used by several hunter-gatherer groups. In order to better understand the operational sequence for the production of the Poggetti Vecchi wooden sticks, an experimental study has been already carried out. This research aim at performing a 3D acquisition of the experimental replicas in order to develop a methodology for the punctual recognition of all the traces present on their surface (use-wear and production traces). Accordingly, the Poggetti Vecchi wooden tools will be analysed and compared without endangering their preservation and obtaining fresh data about their microtopography. The results allow to investigate the Early Neanderthals behaviour bringing to light new insights about the relevance of perishable materials during Prehistory. Finally, this research provides a cutting-edge approach for future investigations on perishable archaeological artefacts, maximising data acquisition while minimising the damages and the manipulation of archaeological tools.

2 MAPPING THE STONES – A 3D GEOMETRY SURFACE CHARACTERIZATION APPROACH TO THE FUNCTIONAL STUDY OF UPPER PALAEOLITHIC GROUND STONE TOOLS

**Abstract author(s):** Florindi, Silvia (Cyprus Institute - STARC; Istituto Italiano di Preistoria e Protostoria) - Aranguren, Biancamaria (Soprintendenza ABAP Siena - Grosseto - Arezzo) - Mariotti Lippi, Marta (Dipartimento di Biologia - Università degli Studi di Firenze) - Revedin, Anna (Istituto Italiano di Preistoria e Protostoria) - Hermon, Sorin (Cyprus Institute - STARC)

**Abstract format:** Oral

In the last years, the production of flour from wild plants has been unequivocally documented starting from the Upper Palaeolithic. Consequently, are also increased the attempts to perform functional studies on stones by using imaging technologies, use-wear and residue analysis. Residue analysis has the potential to provide a reliable basis for reconstructing the operational chain of artefacts and evaluating the past subsistence economy, together with traceology and experimental archaeology. Furthermore, the integration with digital heritage technologies may improve the reconstruction of the nature of prehistoric tasks and resource utilization. The work here presented, within the framework of "Paleo-Diet", a bilateral project between the Cyprus Institute and the Russian Academy of Science and the project "PLUS – PLant USe in the Palaeolithic", a cooperation between the IIPP (Italian Institute of Prehistory and Protohistory) and the Cyprus Institute, aims at using experimental archaeology, 3D modelling, scientific visualisation, and distribution analysis to create a validated methodology to capture, annotate and describe the active surfaces and the residues on Palaeolithic Ground Stones Tools (GST), mainly used to process plant materials. All results of this study might be useful to address future samplings methodologies for residue analysis. The key innovation will be a multidisciplinary approach merging experimental archaeology and digital heritage technologies applied to the experimental and archaeological tools, mostly coming from the Gravettian site of Bilancino (Italy, Florence area).

3 THE DISAPALE PROJECT: 3D MODELS AND LITHIC TYPES

**Abstract author(s):** Di Maida, Gianpiero (Neanderthal Museum)

**Abstract format:** Oral

DISAPALE (Digitale Sammlung Paläolithischer Leitformen, German for Digital Collection of Palaeolithic Lithic Types) is a project hosted and supported by the Neanderthal Museum, financed by the German Ministry of Education and Research that is running since 2018: the project aims at creating a 3D digital catalogue of Paleolithic lithic types. Items from different European collections (starting from the one hosted at the Friedrich-Alexander University, Erlangen-Nürnberg) are to be scanned in 3D, organized in a catalogue according to typological categories, and finally made available for the final users (students, professionals and amateurs) on a digital repository. At the present, ca. 600 artifacts are present in the catalogue and this number is expected to be doubled by the end of this year.

Parallel to the establishment of a workflow in the scanning routine, the DISAPALE project has put us in the position of having to face a series of more theoretical issues, connected with both the so-called digital turn and the more specific field of typology of the lithic artefacts: while the first has literally stormed archaeology in the last years (as every other aspect of modern life, for that matter), the latter has experienced a long and apparently irreversible period of stagnation.

In this paper, the DISAPALE project and its work routine will be presented, including a brief relation on the different technical solutions



adopted so far in the scanning process, and then some of the most relevant theoretical issues (like for instance, the obsolescence of the digital products, the compatibility of their format, their usability and distribution to the final users) will be shortly discussed.

4 **NEW LIFE OF OLD OBJECTS WITH 3D-DOCUMENTATION**  
**Abstract author(s):** Birkelund, Kristina (Museum of Cultural History, Oslo)  
**Abstract format:** Oral  
I work for the relocation project of the Museum of Cultural History in Oslo. We are moving our iron age collection (about 1.7 million artefacts) from an old storage to a new one. During the move I had a number of objects that made me think of 3D documentation. I'm not a 3D specialist, but I have tremendous faith in it. I will present 3 cases that I am working on.

1. The first case is very simple - Artefacts, which would be hard to understand with regular documentation. Examples: artefacts with unknown use. 3D pictures of these artefacts will help a reader better understand what the artefacts are. This is a new form of documentation for our museum. I think, 3D scanning will help us to make visible wear places on such objects and maybe help identify the object's use.
  2. Other cases apply to items with fantastic wood carving (i.e. from the Viking Age Tune ship burial). These objects are in fragments and they are so small that it is impossible to see what they were. Will 3D documentation make it possible to reconstruct such objects or are these unrealistic hopes? Studying of wood carving techniques is possible with 3D scanning with photogrammetry.
  3. The third case is to recreate / reconstruct deformed objects of wood. Wooden artefacts from the Viking Age Gokstad burial are experimental objects for this case. This research is a collaboration with a programming school. We hopefully will see the original shape of the objects.
- What do I want to achieve with 3D in my modest cases? First and foremost to have less "fragment" and "unknown" in the database in the museum, and to make prehistory easier understandable for children. These are my unanticipated intentions for the advanced world.

5 **UNLOCKING THE SECRETS OF PREHISTORIC ROCK ART IN SCOTLAND THROUGH 3D MODELLING**  
**Abstract author(s):** Valdez-Tullett, Joana - Barnett, Tertia (Historic Environment Scotland) - Jeffrey, Stuart (School of Simulation and Visualisation, The Glasgow School of Art) - Robin, Guillaume (University of Edinburgh)  
**Abstract format:** Oral

Rock art is a visual type of archaeological evidence. Traditional recording approaches involved drawings, rubbings, moulding and direct tracing. Although some resulted in impressive artworks of great beauty, these methods are subjective and not entirely useful for research. The introduction of 3D recording techniques has revolutionized the documentation of rock art in the last decade. Scotland holds 40% of the currently known prehistoric open-air rock art in Britain. Although this carving tradition has been recognised for over two hundred years, research and our knowledge of it has been evolving slowly, and many of the questions posed in the 19th century remain unanswered. The Scotland's Rock Art Project is focusing on recording the country's prehistoric carvings and developing new lines of research that will provide a better understanding of this tradition. More than 1000 carved rocks are being systematically recorded in collaboration with trained community teams, using a consistent methodology which includes 3D reproduction of the rock art. Results of this venture are already unlocking some of the rock art's secrets, revealing important details that were previously unnoticed, but also the complexity of imagery in specific regions where only motifs such as cupmarks (small hollows cut onto the rock surface) were known. SfM has also been essential in providing accurate details of the rock art and its iconography, enabling comprehensive analysis of the motifs and affording a deeper understanding of the process of making the carvings. In this presentation we will explore the use of SfM as an accurate technique of rock art documentation, as opposed to other more subjective methods, and its value for fieldwork. We will reflect on the contribution of SfM for rock art research, and how it can and is being used to address specific traditional research questions and to develop new lines of investigation.

6 **THE POTENTIAL OF DIGITAL VISUALIZATIONS FOR EXPLAINING EARLY EGYPTIAN BURIAL PRACTICES**  
**Abstract author(s):** Debowska-Ludwin, Joanna - Rosińska-Balik, Karolina (Jagiellonian University in Krakow)  
**Abstract format:** Oral

We live in the age of visuals. It should not surprise then that the general need for seeing rather than reading reaches archaeology, too. However, digital visualizations are usually seen as "pretty pictures," good for popularization of archaeological finds and more effective fundraising, but not a part of "real" archaeological analyses. Basing on our field experience we will try to break the cliché. The Polish Archaeological Expedition to the Nile Delta has excavated the site of Tell el-Farkha since 1998. The fieldwork has revealed the presence of — among many other discoveries — more than 150 graves dated to the Protodynastic, Early Dynastic, and the early Old Kingdom. Our case studies are some recently discovered burial structures dated to Naqada IIIB (late fourth millennium B.C.). Their elaborate form and diversified sets of objects have opened new possibilities of interpretation, especially when modern digital techniques come to help. In the presentation we will discuss the potential of 3D modelling used for reconstructions of archaeological material, and the potential of 3D reconstructions for dealing with classical archaeological research problems. We aim to show that

digital modelling is not simply a visualization, but a handy tool for better understanding ancient architecture, rituals, and settlement patterns. Thus, we will show the actual structures as they were found in contrast to their reconstructed original state, and trace the complete process of construction, filling, and closing of a Protodynastic tomb, as well as spatial development of the cemetery. Because even the brightest tale has a dark motif, and in the 3D reality we can create whatever we can imagine, we will also address potential dangers to archaeological credibility by technical possibilities, and how in our practice we try to present our research in the most engaging way but not too remote from excavated materials.

7 **A SLIGHTLY DIFFERENT APPROACH TO THE DOCUMENTATION OF RELIEF DECORATION AT THE TEMPLE OF HATSHEPSUT IN DEIR EL-BAHARI, EGYPT**  
**Abstract author(s):** Mackiewicz, Maksym (Polish Centre of Mediterranean Archaeology, University of Warsaw; Archeolodzy.org Foundation) - Iwaszczuk, Jadwiga (Institute of Mediterranean and Oriental Cultures of the Polish Academy of Sciences, Warsaw)  
**Abstract format:** Oral

The Temple of Hatshepsut in Deir el-Bahari is one of the most recognizable archaeological sites of Egypt, placed on UNESCO's World Heritage List. An important part of the ongoing work is the development and implementation of possibly detailed documentation of relief decoration, including hieroglyphs, pictorial representations, intentional and natural destructions. Obtained datasets are an essential basis for further epigraphic studies. The work carried out by the Polish-Egyptian team began in 1961. Since then already cross several 'technological revolutions' and 'methodological turns' in this subject. For many years the method was based on the hand outlining of scenes onto sheets of foil placed on the wall, redrawn later on other media. Currently, for conservation reasons, non-contact techniques based on photography, photogrammetry or 3D scanning are preferred. Then, based on orthophotomaps, the motifs are manually traced in vector graphics software. In this workflow, two-dimensional 'pictures' are mainly used, ignoring the potential of three-dimensional data. Recent efforts have led to develop a slightly different approach based on photogrammetric techniques and propose an alternative way of imaging relief decorations based on 2D, 2.5D and 3D data. The algorithms implemented into raster image analysis and processing, 3D graphics and GIS software were used. The issues of mechanical vectorization will also be discussed, which in some situations allows limiting the role of the illustrator to inspect or correct automatically generated contours. Equally important issue will be the evaluation of effectiveness and optimization of this approach. The research was conducted within the 'Dialog' grant programme of the Polish Ministry of Science and Higher Education (088/DLG/2017/10).

8 **3D APPROACHES IN PALAEOGRAPHIC RESEARCH – THE CASE OF CYPRO-MINOAN WRITING**  
**Abstract author(s):** Polig, Martina (STARC; Ghent University) - Hermon, Sorin (STARC) - Bretschneider, Joachim (Ghent University)  
**Abstract format:** Oral

Cypro-Minoan writing is an undeciphered syllabic Bronze-Age script from Cyprus. There are still many open questions regarding this writing system that concern even basic elements such as the number and shape of signs constituting the script and the underlying language. These gaps in research are in part due to the small size of the corpus that comprises only 251 inscriptions, but a large part can be explained by the challenges posed in the study material available to researchers. These challenges are related to the absence of a catalogue of signs, an essential tool for palaeographic groundwork, and intrinsic problems and limitations of traditional documentation of inscriptions. They not only consist in the difficulty of creating an adequate 2D documentation (lighting and positioning, magnification and surface texture) but also the impossibility to capture geometric properties such as depth and angle associated with the reduction of an inherently 3D element to 2D and the subsequent loss of information. Consequently, signs are only described through descriptive and subjective means which makes an objective comparison challenging, an already difficult task due to the amount of data that needs to be evaluated with sign numbers being in the thousands.

This paper discusses how through 3D approaches the problems in the base study material of Cypro-Minoan research are addressed by providing a high resolution 3D documentation and a digital sign repository where each sign is characterized objectively and with its geometric properties. This will enable for the first time an objective evaluation and discussion of the shape and number of signs in the Cypro-Minoan signary as well as potentially highlight temporal and regional differences in sign rendition. In doing so new challenges in 3D approaches to palaeographic research are being introduced and explored that relate to the analysis of sign shape across different supports and materials.

9 **USING 3D MODELS OF ANCIENT FINGERPRINTS TO ANSWER QUESTIONS ABOUT THE RELATIONSHIP AMONG LABOUR, SEX, AND GENDER**  
**Abstract author(s):** Hruby, Julie (Dartmouth College)  
**Abstract format:** Oral

A wide range of prehistoric and ancient Greek ceramic objects, including vessels and ceramic sculpture, preserve the dermal ridge (finger and palm-print) impressions of their producers, fixed when they were fired. Traditionally, archaeologists have tried, with vari-



able success, to match prints in an effort to understand ancient labor systems. Archaeologists worldwide have begun to ask questions, including the sex of the people whose prints they were, that require less specific print material. Problematically, most have focused on print size; however, shrinkage rates vary even for a single clay type, especially in cases where objects have been fired inadvertently (e.g. in a building fire rather than a kiln). Additionally, it is impossible to differentiate the prints of older juvenile males from those of adult females, since their sizes overlap substantially.

Fortunately, structured-light scanning allows us to build high-resolution 3D models of prints, akin to digital elevation maps, allowing us to examine a much wider range of sex-linked features. These include the ratio of ridge thickness to valley thickness (RTVTR), “secondary crease” frequencies (casually called “wrinkles”), and “incipient” lines. Robust statistical models based on these factors allow us to establish the probable sex of ancient producers based on their prints.

The current project establishes this methodology, using 3D scans of the prints of modern Greek adult potters of both sexes as a reference sample. Prints are taken from objects on which they were left inadvertently, because this format mimics what we see on ancient objects. Modern Greek ceramicists are both genetically and occupationally as close as we can get to their ancient predecessors. The technique will make it possible to rigorously evaluate longstanding archaeological questions, including the sexes (and as a result the genders) of producers of ceramic figurines, ceramic tablets, and ceramic sculpture.

10

### SCHEMATA – 3D CLASSIFICATION AND CATEGORIZATION OF ANCIENT TERRACOTTA FIGURINES

**Abstract author(s):** Böttger, Lucie - Zeckey, Alexander (Institute for Digital Humanities, Georg-August-University Göttingen)

**Abstract format:** Oral

Three-dimensional objects with complex shapes are inadequately classified both in applied computer science and disciplines dealing with material artefacts. Archaeologists are confronted with the problem that resemblance in shape can be recognized and established, but is much harder to support with reasons and to describe adequately in language. Furthermore, archaeologists have yet to make sufficient use of automated 3D shape recognition to differentiate the mutual, formal dependency of similar figures.

Based on 200 terracottas from the 4th and 3rd century BC ancient Greece, a classification system will be elaborated with digital methods. We choose this object group because it is defined by its complexity in shape and the similarity between the objects.

The goal of the case-study is to develop procedures for automatically generating corpora using 3D pattern recognition, as well as to reflect on the associated schematizations and how they can be applied in computer science and visual sciences.

For this purpose, methods of object mining in 3D data are to be developed. In close cooperation between computer science and archaeology, this experimental process leads to a fundamental examination of the concept of pattern recognition as a humanities category.

The case study started in 12/2019. In the presentation we will present preliminary results.

11

### LOST AND FOUND - VIRTUAL REDISCOVERY, DIGITIZATION AND INTERPRETATION OF AN ENIGMATIC FRAGMENT FROM THE TEMPLE OF ZEUS AT OLYMPIA

**Abstract author(s):** Patay-Horváth, András (ELKH Archaeological Institute) - Loucas, Nicolas (Cyprus Institute, STARC)

**Abstract format:** Oral

The author was trying to locate a small marble fragment, which was most probably belonging to the sculptural decoration of the temple of Zeus at Olympia, and was described and published with some drawings already during the 19th century. The research only led to the disappointing conclusion that the fragment has apparently disappeared during the past century and what is even more frustrating, there is absolutely no photographic documentation available either. Finally it turned out that a mould survives from which plaster casts were made during the 19th century and preserves the negative form of the fragment. This old mould was used to produce a fresh plaster cast, which was digitized immediately. In this way a virtual replica of the lost fragment is now available for research and the old controversy surrounding its interpretation can be rehearsed. Previous suggestions are discussed and a new reconstruction is proposed, accompanied by a 3D visualization.

### a. THE INFLUENCE OF MODERN TECHNOLOGIES ON OUR PERCEPTION OF HUMAN REMAINS. NEW TECHNOLOGIES/ NEW POSSIBILITIES/ NEW ETHICAL ISSUES

**Abstract author(s):** Tomczak, Sonia (Nicolaus Copernicus University in Toruń)

**Abstract format:** Poster

Should human remains be displayed? Is it ethical to present our ancestors’ remains to the public? Does 3D visualisation replacing the remains solve the problem of current situation regarding ethical issues concerning presenting of a dead body? The debate about displaying human remains is not as dynamic in Poland as in other western countries in Europe, where there are arising new legal documents or guidelines on this matter. In Poland, one does not have at one’s disposal clear-cut norms regarding presenting of human remains. In the light of this ensuing situation, is the use of modern new technologies, including 3D models of skeletons and graves, a solution for the discussion about this subject or it is quite the opposite, it is only an alternative which leaves the same ethical questions?

This is a complex issue which includes a lot of elements, among other status of a human after death. Can one say that a human is still

a human or does he/she become an artefact, which is made available for tourists at a museum? Museologists can look for a support in ICOM Code of Ethics for Museums, although it does not say much about human remains, describing them, together with material of sacred significance, as “culturally sensitive material”.

Besides the ethical issues one can not ignore the possibilities we gain by the use of modern technology such as 3D models that makes it easier to popularise knowledge and development of research by creating an easier access to the research materials. A lot of visualisations are generally available on the Internet platform e.g. SketchFab. Still, do we have the right to display the remains of our ancestors to the public? Are the new possibilities, which are given to us due to the technological development, against the ethics of displaying human remains?

b.

### REVITALISATION OF VIKING AGE BOATHOUSES, WITH THE USE OF 3D TECHNOLOGY

**Abstract author(s):** Nytnun, Arve (Dept. of Culture heritage, Møre og Romsdal county)

**Abstract format:** Poster

In 2018, the Dept. of Culture heritage, in the county of Møre og Romsdal in Norway, initiated a project on digital dissemination. The main goal for this project is to revitalise three medieval localities that all are of great importance on the western coast, but also has national significance, as important centres in relation to early Christianity, urbanism and trade, and strategic military places.

Through scientific methods our goal is to collect as much knowledge about the sites as possible, but also general knowledge about the early medieval Nordic early towns (køpstadir), so that the visualising of the 3D models, in the best way possible resemble the data’s; from both archaeological excavations and historical sources. The use of GIS-systems and analysis is an important method in the creation of a topographical map of the sites.

In the pre-project of the 3D-visualization, the case of revitalisation was two boathouses most likely related to the early regional levy organization, maybe related to the early christening under Haakon the Good (Norwegian Viking king from mid 1000th century).

LIDAR data along with visual effects used to visualize vegetation and geological futures set the scene for the location. Then the knowledge, collected through specialised seminars about early towns in Northern Scandinavia, communication with museums with knowledge of traditional house-building were communicated with computer-engineers, specialised in game technology.

The result of the pre-project is a model of how two late Viking/age- medieval boathouses could have looked like, based on the best knowledge available.

Discussing: Through the work of visualising two prehistoric boathouses, several new problems appear. How do we handle the “black holes” that we suddenly have to address in the process of visualising the historical landscapes? Are the black holes maybe the most important investigations after all?

c.

### 3D RECONSTRUCTION AS AN INTERPRETATION

**Abstract author(s):** Styk, Matej (Department of Archaeology Faculty of Arts Constantine the Philosopher University Nitra)

**Abstract format:** Poster

The poster presents a case study from the research of the Medieval castle of Peťuša (Zvolen). The main goal is to apply documentation and analytical procedures based on the application of 3D technologies. During the archaeological research of Peťuša castle, several methods were used to document the castle hill, archaeological contexts and artefacts. The aim of the paper is to point out the possibilities of 3D visualization, which serves not only for an interesting presentation of archaeological results to the general public but also for the work of archaeologists themselves. The primary goal is to use 3D technology in the analysis and subsequent interpretation of the phenomena examined in a form that is not common for archaeological procedures. These techniques are applied in interpreting the layout of the castle, castle grounds and the surrounding environment. The main contribution is the clarification of spatial relations, visualization of the examined structures and the opening of polemics within the interpretation levels.

d.

### 3D MODELING AS A TOOL FOR ANALYZING AND UNDERSTANDING CHANGES IN THE TERRITORY OF ARCHAEOLOGICAL SITES

**Abstract author(s):** Gainullin, Iskander (Research Centre “Country of Cities”, Kazan) - Usmanov, Bulat (Institute of Environmental Sciences, Kazan Federal University)

**Abstract format:** Poster

This work is continuation of the research aimed at developing of a system for analysing of risks of destruction of archaeological objects of Volga-Bulgaria period (X–XIII centuries AD) on the territory of the Republic of Tatarstan (Russian Foundation for Basic Research project №18-09-40114). For a better understanding of the fortification system, river dynamics and negative exogenous and anthropogenic processes, a 3-D model was developed using UAV photos as a result of fieldwork in 2017-2019. Modern field survey with use of UAV and GNSS methods applied to study the relief of monument territory. Aerial photographs of the area were produced with a multi-rotor UAV. The GNSS survey of ground control points (GCP) was performed in Real Time Kinematics (RTK) regime in World Geodetic System 84 (WGS84) with real-time corrections by satellite reference stations for UAV data processing accuracy improvement. The model was created using AgiSoft Photoscan software. DEM analysis, mapping and calculations were conducted in Golden Software Surfer 13 software. A digital terrain model (DTM) with a step of 0.5 m showing the altitude characteristics of the settlement territory generated by the point cloud. Profiles, inclination and aspect maps described the morphometric characteristics of

settlement relief. The 3D visualization of fortified settlements helps to detect the changes caused by natural and human impacts, identify trends in monuments state and to quantify the risks of their destruction.

e. **MATTANZA TUNA FISHING VESSELS OF PORTOPALO, SICILY: PHOTOGRAMMETRY AND 3D MODELING**

**Abstract author(s):** Zak, Claire (Texas A&M University)

**Abstract format:** Poster

Tuna fishing has been a staple in the Sicilian economy from ancient times into the 20th century. Southern Sicily especially benefitted from the prosperity of the industry and built infrastructure known as tonnare for tuna processing and special mattanza vessels to exploit the fish during the warm summer months. Sicilians possessed a unique fishing method because of these boats, which contain distinctive construction features that specifically aid in the capture of tuna. Since the tuna fishing economy of Sicily has largely diminished, many of the now derelict boats have fallen into disrepair. It is necessary to record and study these cultural heritage objects to preserve their information for the members of the southern Sicilian community and for the research of future scholars. In June of 2019, three of these mattanza boats were digitally recorded using a newly developed combined method of photogrammetry and laser scanning, known as photogrammetric texture mapping (PTM), thus producing 3-D models. These digital recording methods are beneficial in a number of ways, including a user friendly platform for manipulation, great accuracy of details for measurements and analysis, and ease of data sharing and dissemination. One of the achieved goals of this project was to use the 3-D PTM models to produce sections and hull lines to study volumetrics, as well as an orthophotograph to create construction drawings. This research project serves not only as an evaluation of the PTM methodology for cultural heritage documentation, but also the preliminary data for the conservation of these vessels. Together, the lens of the tuna fishing mattanza vessels will supplement the greater goal of delving into the social and economic history of southern Sicily.

**219** **ARCHAEOLOGY IN 3D – NEW TECHNOLOGIES FOR OLD QUESTIONS. PART 2**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Jerem, Elizabeth (Archaeolingua Foundation) - Patay-Horváth, András (Archaeological Institute of the Hungarian Academy of Sciences) - Hermon, Sorin (Cyprus Institute, STARC)

**Format:** Regular session

The increasing availability of 3D datasets produced by photogrammetry, laser scanning, and procedural modelling in the last decades have offered new opportunities for the recording, documentation and scientific visualization of archaeological sites, environments and artefacts. Still debatable are their overall contribution to grand challenges in archaeology or the clarification of old puzzles which engaged generations of archaeologists so far. Analyses that would explicitly aim to do this remain few and far between, despite often producing promising but at the same time inconclusive results. Since the impact of the new technologies will largely depend on the long run on the successful combination of old problems and new methodologies, the proposed session would like to invite scholars with an interdisciplinary interest in archaeology, architecture, material culture, cultural heritage, computer graphics, morphometrics, machine learning etc. to present works that demonstrate how 3D datasets actually contribute to elucidate classical problems of archaeological research. We welcome presentations focusing on quantitative analysis of SFM and 3D models of archaeological artefacts and spaces, formal visibility, acoustic and lighting analysis of archaeological environments, analyses of immersive VR experiences (e.g. via the use of eye tracking devices etc.), 3D GIS analysis, volumetric, structural and statistical analysis of 3D data and scientific visualisation of sites, environments or artefacts, participants being encouraged to critically evaluate any methodological and theoretical issues related to these approaches.

**ABSTRACTS**

**1** **UNCOVERING INVISIBLE: VISUAL ENHANCEMENT OF TOOLMARKS PRESERVED ON THE ROMAN TILES**

**Abstract author(s):** Janek, Tomáš (Institute of Classical Archaeology, Charles University, Prague)

**Abstract format:** Oral

3D technologies usually serve as a documentation method which allows to copy artefacts or whole archaeological situations and even sites in digital form. However, the preservation of archaeological data is not and should not be the only purpose. 3D technologies also present a tool for analysing the data, discovering and retrieving new information, information which could be previously invisible to the archaeologist.

This contribution focuses on the technological development of Roman military tile manufacture in ancient Vindobona. The aim of the research was to distinguish various production techniques and statistically evaluate them. Photogrammetry along with Reflectance Transformation Imaging (RTI) were chosen as the main research methods. The solid mesh of the 3D model enables examination of finds without disruptive elements such as colour or calcareous sinter. The simulation of various angle of lighting helps to enhance and to identify the cuts and other traces, left by the work tools or moulds. However, the quality of results is determined by the quality of detail of the 3D model. High quality 3D model requires substantial computing power and is also more time consuming. For the examination of a plane surface, RTI turned out to be more suitable. It provides more detailed visual enhancement and needs less computing power. Disadvantage of the method lays in the specific conditions required during the documentation.

With help of the both methods it was possible to successfully identify the various production techniques and connect them with unit which produced the material. It was also possible to document the development of certain techniques and their transfer between the different production centres.

**2** **SEE WHAT’S INSIDE: 3D IMAGING OF MEDIEVAL RUSSIAN PECTORAL CROSSES**

**Abstract author(s):** Zaytseva, Irina (Institute of Archaeology Russian Academy of Sciences) - Kovalenko, Ekaterina - Podurets, Konstantin - Murashev, Mikhail (Nacional Research Center)

**Abstract format:** Oral

Pectoral crosses should be regarded as a meaningful phenomena of Medieval Rus’ culture. A question that has been troubling the minds of scientists for the 150 years: what relics were worn by medieval people in these crosses? As a rule, archaeologists find separate leafs from these items. Finds of entire closed encolpions are quite rare and of great scientific interest. In recent years, as a result of legitimate archaeological research, about 20 closed pectoral crosses have been obtained. They originate from Novgorod, Moscow, Suzdal and rural settlements of the Suzdal district. The use of non-destructive methods of neutron and synchrotron imaging based on the interaction of penetrating radiation with matter allowed us to obtain information about the internal structure of encolpions, the presence of relics in them with their physical characteristics and their location inside the cavities.

The work used the equipment of the Kurchatov Institute located on two radiation sources: the IR-8 thermal neutrons reactor and the Kurchatov synchrotron radiation source. Neutron and synchrotron (x-ray) imaging are complementary methods due to the different nature of the interaction of radiation with matter. 11 encolpions have been studied. 3D models of their internal structure based on three-dimensional images of objects were created for 5 items. The paper presents methods and results of this work.

The surfaces of the leaves of some encolpions are decorated with niello. A 3D model for the niello decor of 1 pectoral cross was created. It allows to see its location and fit to the surface of the leaf in all details.

The built 3D models are able to work with archaeological and museum artifacts at the modern high-tech level: scientific analysis, creation of virtual and real copies, demonstration for the promotion of cultural heritage objects.

Research was supported by the Russian Foundation for Basic Research 17-29-04129.

**3** **DIGITIZING THE HERITAGE OF PALMYRA: OLD CHALLENGES AND NEW SOLUTIONS FOR DOCUMENTATION AND PRESENTATION OF WAR-ENDANGERED ARCHAEOLOGICAL SITES**

**Abstract author(s):** Blochin, Jegor - Solovieva, Natalia (Institute for the History of Material Culture, Russian Academy of Sciences) - Solovyev, Sergey (Institute for the History of Material Culture, Russian Academy of Sciences; State Hermitage Museum)

**Abstract format:** Oral

After the first liberation of Syrian Palmyra in March 2016 the 3D mapping of damaged sites has become one of the most important tasks for specialists in digital archaeology working in the region. The Institute for the History of Material Culture (Russian Academy of Sciences, Saint Petersburg) organized several survey expeditions in making an attempt to contribute to international efforts of digitizing Syrian heritage on a macro-level with a large-scale aerial survey of the entire territory of the ancient city of Palmyra.

During this survey we covered an area of ca. 14 sq.km and received more than 100000 aerial images (planar and oblique) with 2,5 to 7 cm/px resolution. The received photos were processed with Agisoft Photoscan and a detailed 3D model of ancient Palmyra was created. Based on this model we produced detailed geopositioned orthophotographs for the territory of the ancient city and nearby necropolis, as well as a detailed DEM. Currently we develop an online archaeological 3D GIS based on the imagery received – a multipurpose tool for damage assessment and cultural heritage management, for planning and conducting new research on the site and opening new insights in the understanding of the city infrastructure, topography and landscape development. The main purpose of these efforts is to give open access to all the collected data to the research community and to promote the knowledge about Syrian heritage in the world.

**4** **BUILDING EMPIRES– NEW RESEARCH ON CBM AND STAMPED TILES ON ROMAN FRONTIERS– INTRODUCING THE CLIR RESEARCH CENTER AND LIMES DATABASE**

**Abstract author(s):** Farkas, Gergo (CLIR Research Center – University of Pécs)

**Abstract format:** Oral

Presenting the preliminary results of the project aimed at documenting, evaluating and presenting the vast CBM material of the Danube Limes area in Hungary. A collaboration involves national and local museums and the recently established CLIR Research Center with the aims to extend research over the frontiers.

The project goal is to systematically complement and update former collections with both quantitative aspects (fabric, position of manufacturing features) and qualitative ones (paleography of stamps and surface markings, epigraphic digitalization). Recorded specimen are published in a publicly accessible online database. Documentation is complemented with methodological novities as 3D modelling and Highlight-Reflectance Transformation Imaging (H-HRTI) to interpret specimen which previous study has not been able to identify.

The results of the project are twofold: on one hand database answers questions of production modes, distribution, supply patterns.

5 On the other hand, in-depth analysis of helps clarify the phasing of sites, thus complementing our understaning of historic processes.

The CLIR Research Center conducts and coordinates research on the Roman frontiers. We collaborate closely with heritage management experts (Castle Headquarters Integrated Regional Devepment Centre NLtd. – Limes Management Group, Prime Minister’s Office), our colleagues from various national and local museums and international committees (Bratislava Group). We are based in Pécs, operating at the University of Pécs.

Along the tilestamp database, the CLIR Research Center is managing an open-source, linked scientific database built along ARIADNEplus principles with the purpose of providing a reliable research and coordination tool for experts and public on the complex system of the Danubian frontier. The database is developed in collaboration with „Frontiers of the Roman Empire” WHS experts from Germany, Austria, Slovkia, Hungary, Croatia, Serbia, Romania and Bulgaria and its scheduled to be brought online for the public in May 2020.

We kindly invite you to follow our work at <http://clir-research.hu>.

## 5 DIGITIZED TRADITIONAL METHODS FOR SCIENTIFIC VISUALISATIONS

**Abstract author(s):** Toulouse, Catherine - Lengyel, Dominik (BTU Cottbus-Senftenberg)

**Abstract format:** Oral

Recorded 3D datasets are only the first step towards scientific visualisations. 3D modeling of archaeological site goes far beyond, if archaeology is successfully combined with architectural design. An interdisciplinary approach translates archaeological hypotheses into architectural design. Old problems like inherent uncertainties in knowledge ranging from obvious extrapolations to quite probable completions can be encountered by the new methodology of designing abstract forms that mediate uncertainty yet provide the uncertain given information. This way, cultural heritage and computer graphics merge into a conclusive 3D dataset that not only elucidates classical problems but even solves them, not only concerning spatial analysis, but also its photographic spatial impact. The mere concentration of formal visibility, of the geometry, enables the visualisation of uncertainty to focus on a relatively high degree of certainty compared to visualisations that include the representation of materials or only polychromy. This way, archaeological research can continue to work on the achieved state of knowledge instead of dealing with purely speculative additions. This method includes all kind of data, photogrammetry, laser scanning and modelling, and works for sites, environments and artefacts.

The presentation aims to demonstrate and illustrate this method by several projects developed by the authors in cooperation with archaeological research institutions like

- Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral),
- Bern Minster, its first century (by order of and published by Bern Minster Foundation)
- The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOI, exhibited as part of Sharing Heritage, the European Cultural Heritage Year 2018),
- The Palatine Palaces in Rome (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin),
- The Ideal Church of Julius Echter (by order of the Martin von Wagner Museum in the Würzburg Residenz combining physical models, auto-stereoscopy and VR experience).

## 6 THE USE OF NEW TECHNOLOGY TO UNDESTRAND ANCIENT CONTEXTS AND EXCAVATIONS: EN EXAMPLE FROM LAZIO (ITALY)

**Abstract author(s):** Pansini, Antonella (Sapienza Università di Roma; Scuola archeologica Italiana di Atene)

**Abstract format:** Oral

As is known, archaeological excavation is an unrepeatable activity which involves, in many cases, the destruction of ancient contexts to allow the activities to proceed: it occurs both in cases of excavations for scientific purposes and in those related to Preventive Archeology. Thanks to the use of new technologies now we are able to document all that is found at 360 °: the photogrammetric and laser scanner survey permit to acquire metric (planimetric and volumetric) and spatial data on the object in a very short time: in this way nothing is really lost after its destruction, The three-dimensional models, indeed, will forever be consulted for an a posteriori study on the excavated context.

For the less recent excavations, however, the memory was entrusted to a few photographs, drawings and descriptions in the excavation papers. The investigations of the early XX century. conducted in Ostia under the supervision of Dante Vaglieri and aimed at reuniting the Necropolis of Porta Romana area with the Capitolium is an emblematic case. Although we were still in the years when the stratigraphic excavation had not yet emerged, all the findings were noted with extreme care and attention for layers, levels and altitudes. The following contribution aims to examine the specific case of the excavation of the “Piazzale dei Quattro Tempietti”, near the Theatre of the colony, and show how, through the use of new technologies and starting from the new survey of the remains, it is possible to georeference old drawings made by Italo Gismondi, reconstruct the stratigraphy, analyze the findings and to formulate reconstructive hypotheses on the ancient contexts. Thanks to the aid of three-dimensional modeling, moreover, it was possible to reconstruct the volumes of the demolished structures.

## 7 THE AMPHITHEATRE OF CASINUM (CASSINO, LATIUM): STRUCTURAL ANALYSIS AND ARCHAEOLOGICAL RECONSTRUCTION THROUGH 2D AND 3D SURVEY

**Abstract author(s):** Trivelloni, Ilaria (Université de Lausanne - Sapienza Università di Roma) - Antonelli, Giacomo (Sapienza Università di Roma)

**Abstract format:** Oral

Since 2019, we have been carrying out non-destructive investigations in the amphitheatre of the Roman city of Casinum, in southern Latium. Aim of the research, still ongoing, is a complete reassessment of the building, through new, accurate structural analyses which will lead to a total reconsideration of the studies produced so far. Our work will clarify not only the functioning of the amphitheatre per se, but also its main circulation patterns. The innovative approach of the technical-structural analysis carried out through 3D photogrammetry, as well as the production of a digital terrain model (DEM) with the use of UAV (Unmanned Aerial Vehicle), will shed new light on specific construction methods in relation to the morphology and geology of the soil. The consequences of WW2 bombing of the Abbey of Montecassino, followed by substantial restorations, hinder a thorough and uniform understanding of the remains.

New and more accurate analyses of the amphitheatre is giving the opportunity to better understanding of its relationship with the Roman settlement, as well as with its urban and suburban road network.

## 8 MONITORING OF URBAN HERITAGE IMPLEMENTING 3D AND CONVOLUTIONAL NEURAL NETWORKS-BASED TECHNOLOGIES

**Abstract author(s):** Kuncsevicius, Albinas (Association of Lithuanian Archaeology) - Žižiūnas, Tadas - Laužikas, Rimvydas (Vilnius University) - Amilevičius, Darius (Vytautas Magnus University) - Šmigelskas, Ramūnas (Vilnius University)

**Abstract format:** Oral

Preservation of urban heritage is one of the main challenges for contemporary society. The possible solution to these problems could be automated heritage monitoring, based on the 3D and AI technologies. Proposed solution is realized by a project financed by Research Council of Lithuania “Automated monitoring of urban heritage implementing 3D technologies” (nr. 01.2.2-LMT-K-718-01-0043). The first results of the project are presented in this paper.

During the research, the following actions were taken: (i) selection of the valuable properties to be captured and monitored; (ii) identification of damage factors; (iii) linking of specific valuable properties to specific damaging factors; (iv) determination of mathematical indicators applicable to the measurement of change; (v) exclusion of sets of valuable and their description by algorithms; (vi) verification of data reliability; (vii) application of artificial intelligence technology to the monitoring.

In order to perform the detection of valuables, we first need to train the AI algorithms to identify the desirable valuables from the data – 2D pictures or 3D point clouds. The newly established database for this consists of collected pictures from the main streets of the Vilnius’ Old Town. For data annotation, Labelbox is used. The first two classes (valuables) are created: windows and doors. For performing the training task, the currently most powerful open data algorithms of Google’s Tensorflow were used. In this case, an XML file is the result of annotation. This means that the annotated information in the c++ language is described according to the standard of Pascal VOC.

To sum up, the results of the first laboratory experiments with the primary version of the pooled data resource achieving 80% accuracy in semantic segmentation of objects into two classes (windows and doors) suggest that the chosen technology solutions and developed methodology will be adapted successfully to achieve project objectives.

## 9 DIGITAL RELATIONSHIPS - VISUALISING AND REPRESENTING COMPLEX SKELETAL ASSEMBLAGES WITH 3D POINT CLOUD DATA

**Abstract author(s):** De Simone, Samantha (Bournemouth University)

**Abstract format:** Oral

The implementation of digital tools occupies a crucial role in both traditional and forensic archaeology, from the recording of trenches and artefacts during fieldwork to the capture of visual records at a crime scene. In both instances, in order to obtain quality data and explain complex spatial relationships, the analyses need to be performed with robust techniques.

Among the novel technologies largely applied both during fieldwork and post-excavation analyses is multi-view-stereo structure-from-motion (SfM-MVS) photogrammetry. SfM-MVS generates a three-dimensional (3D) point cloud data from a set of overlapping photographs taken at different viewing angles, representing an accessible and affordable medium for forensic practitioners. Due to its accessibility, being both an affordable and time effective technique, SfM-MVS has been implemented for commercial archaeology projects and for in situ resource for forensic specialists at a crime scene. Therefore, this study focuses on the validation of SfM-MVS for the recording the excavation and relationships of complex deposits, specifically in mass graves scenarios, where human remains may have high levels of fragmentation and commingling.

The aim of the research is to represent and store the entire excavation sequence in a single 3D point cloud. A complete sequence of the grave with point cloud data would serve as a permanent record, allowing a more accessible re-interpretation and sharing of data. Moreover, it could bridge the gap between excavators and laboratory practitioners, enhancing the understanding of in situ artefacts and the relationships of disarticulated and fragmented skeletons with their context.



THINKING OUTSIDE THE (WHEELER-KENYON) BOX: A PHOTOGRAMMETRY ASSISTED METHODOLOGY FOR THE DOCUMENTATION OF COMPLEX STRATIGRAPHIC RELATIONSHIPS

**Abstract author(s):** Whitford, Brent (University at Buffalo) - Boyadzhiev, Kamen (National Archaeological Institute with Museum - Bulgarian Academy of Sciences) - Ivanov, Miroslav - Tyufekchiev, Konstantin (South-West University “Neofit Rilski”) - Boyadzhiev, Yavor (National Archaeological Institute with Museum - Bulgarian Academy of Sciences)

**Abstract format:** Oral

At Tell Yunatsite, a prehistoric settlement mound located in the Upper Thracian plain of Bulgaria, stratigraphic relationships between archaeological deposits (i.e. contexts) are incredibly complex. Indeed, such is the case of most prehistoric settlement mounds, which prompted our exploration into utilizing new technologies to answer a very old question—how might stratigraphic relationships best be documented during the process of archaeological excavation? Currently, the Wheeler-Kenyon box method is perhaps the most common and widely utilized method of stratigraphic documentation. It consists of the excavator leaving a balk at set intervals in between excavation units to form a grid from which stratigraphic relationships may be documented in profile. However, such a system is only of limited use as contexts are often severely tilted, folded, and/or are restricted in their horizontal extent, making their identification across multiple spaced out profiles extremely difficult and at times impossible. An additional method, the Harris Matrix, although useful, is merely a representation of stratigraphic relationships in diagram form that provides no visual facsimile of the field from which to make further assessments and/or corrections. In this paper, we present the results of a photogrammetry assisted methodology for the documentation of stratigraphic relationships developed to compensate for the shortcomings of currently utilized methods. First, using a UAV drone we produced a high-resolution photogrammetric model of the entire mound. Second, with stop from motion photogrammetry, we produced 2.5D surfaces of several excavation units in stratigraphic succession. Finally, utilizing GIS, we digitized the horizontal extents of each context and filled the space between successive surfaces until a faithful 3D model of each context was generated. The latter models are then combined and rendered simultaneously to form block diagrams of the excavation units that may, in turn, be cross-sectioned in any direction to view stratigraphic relationships in virtual profile.

LOOKING BEYOND THE MICROSCOPE: INTERDISCIPLINARY APPROACHES TO USE-WEAR AND RESIDUE ANALYSIS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Dolfini, Andrea (Newcastle University) - Lemorini, Cristina (‘Sapienza’ University of Rome) - Caricola, Isabella (Newcastle University) - Petrovic, Andja (‘Sapienza’ University of Rome; University of Belgrade) - Vinet, Alice (Université Paris 1 Panthéon Sorbonne)

**Format:** Regular session

Use-wear and residue analyses have come to play a fundamental role in archaeological enquiries into the cultural biographies of past artefacts. Deployed either separately or in conjunction with one another, they have been turned by three generations of researchers into core scientific methods for understanding the behavioural and social interactions of prehistoric communities. In the last few years, a concerted effort has been made to improve and standardise research procedures in the two disciplines through explicit replication strategies, rigorous analytical and experimental protocols, and blind testing. This has ensured a degree of disciplinary maturity that, when successfully contextualised, can be harnessed to reach some of the highest dangling fruits of the interpretative tree and develop new explanatory models for past human behaviour.

The session invites specialists in world prehistory to present their inter- and cross-disciplinary research into primate and human archaeology from the Lower Palaeolithic to the Metal Ages. It aims to explore socially contextualised problems, in which use-wear and residue analysis (on any materials and artefacts) are deployed as part of a wider range of integrated research approaches. The papers will discuss broad questions concerning the human past including the making of the mind in both primate and human evolution, technological changes and technological choices, interaction between and within communities of practice, skill, and acculturation (or lack thereof) following technology transfer. A parallel poster session will host contributions with narrower and more method-oriented foci.

ABSTRACTS

EARLY HOMININS EVOLUTIONARY PROCESSES: MAY USE-WEAR AND RESIDUES ANALYSES HELP TO UNDERSTAND THEM?

**Abstract author(s):** Lemorini, Cristina (Sapienza University of Rome) - Marinelli, Flavia - Venditti, Flavia (TAU Tel Aviv University)

**Abstract format:** Oral

Behavioral flexibility of early hominins is considered a crucial evolutionary agent, activated in order to counteract environmental constraints, changes, and pressures (Villamoare et al. 2015). Adaptation to different environments implies the adaptation to different foods and, therefore, the acquisition of new types of diets which are more advantageous to the survival of individuals and species. The “Expensive Tissues Hypothesis” (Aiello and Wheeler 1995) and, more recently, the “Human Predatory Pattern” (Thompson et al. 2019) are two models that, while starting from a different point of view, focus both on the central idea that easily digestible animal

food have furthered the expansion of brain tissues. Following these hypotheses, the evolutionary pressure towards more and better animal food should have urged hominins to improve their strategies of exploitation both of hunted and scavenged animals.

Stable isotopes (Hardy and Buckley 2016) and especially dental microwear and dental calculus (Martinez et al. 2016) have recently suggested that the consumption of plant foods remains a constant in the diet of early Homo. As such, plant nutrients could also have played a role in brain expansion through food collecting and processing with the help of more efficient technological strategies.

Starting from these premises, may use-wear and residues analyses have a role in this complex picture to better define already proposed models or to stimulate the elaboration of new ones? This presentation aims to evaluate the potential of the functional data acquired through these two analyses to highlight “pieces of the evolutionary puzzle” through an overview of the published results from Lower Paleolithic contexts.

FUNCTIONAL AND CHEMICAL ANALYSES DISCLOSE ADAPTIVE HUMAN STRATEGIES AT THE LATE LOWER PALEOLITHIC SITE OF REVADIM (ISRAEL)

**Abstract author(s):** Venditti, Flavia - Barkai, Ran (Tel Aviv University)

**Abstract format:** Oral

More and more often, the study of material culture in archeology is conducted with an interdisciplinary perspective which integrates different approaches and scientific disciplines for understanding past human behaviors. In the field of the use-wear analysis, the integration of the residue observations has greatly increased the reliability of the functional interpretations, especially on early archeological assemblages.

Here, we show the potential of combining chemical spectroscopic analyses of ancient residues to the interpretation inferred from the use-wear analysis and experimental observations at the late Lower Paleolithic Revadim site. The outstanding preservation condition of organic and inorganic animal residues adhering to the lithic surface of tools in area C layer 3 allowed their morphological characterization, later cross-checked through two independent and non-destructive techniques: the Fourier Transform Infrared spectroscopy (FTIR) and the Energy Dispersive X-ray spectroscopy (EDX). The presence of several micro residues of hydroxyapatite, adipocere, collagen and tendons fibers, coupled with the evidence of edge scarring and polish allowed to distinguish different mode of use, according to the technological and morphological features of analyzed specimens. We found that the chopping tools were used in thrusting percussion on hard and medium materials such as bone, likely for marrow extraction; side scrapers were involved in scraping activities on medium materials while small flakes were used to mainly performed fine cutting activities on soft and soft to medium materials like animal fleshy tissues. The methodology used in this work proved to be an effective approach to reveal the feasibility and flexibility of the Revadim hominins in producing and using a diversified set of implements, including heavy and light-duty tools, to be used for targeted tasks during specific stages of the carcass animal processing.

LIVING ON THE AWASH. EVERYDAY LIFE AND ACTIVITIES OF A LATE STONE AGE COMMUNITY

**Abstract author(s):** Mutri, Giuseppina (The Cyprus Institute) - Ruta, Giancarlo (University of Ferrara) - Mussi, Margherita (Sapienza, University of Rome)

**Abstract format:** Oral

Beefa Cave is part of Melka Kunture archaeological site and it opens on the right bank of the upper Awash river, at 2000 m a.s.l. on the Ethiopian highland.

When first discovered, obsidian artefacts scattered on the surface suggested that archaeological layers were still in place and in November 2019 we opened a 2x1m test pit.

The exposed levels yielded a very standardized lithic complex, rich in bladelets, made in obsidian, which includes the complete production sequence of lithic tools, from raw material (small obsidian pebbles) to geometric microliths, the artefact class which so far mostly characterizes Beefa Cave. The stratigraphic sequence unearthed during the first digging season, with continuously overlapping fireplaces, suggests recurrent but possibly short-lived occupations and also yielded charcoals and a substantial amount of charred seeds. Most of the artefacts show signs of wear, currently under study, probably related to butchering activity. This would be consistent with the macrofractures detected on microlithic geometric tools which are possibly related to impact.

Our preliminary interpretation is that processing killed animals was the main activity performed at the site. This paper will verify this hypothesis through use-wear analysis and the study of residues on a selection of blanks and retouched tools. The analysis of potential impact fractures on geometric tools on a significant and standardized sample, could offer detailed information about hafting technologies and hunting techniques, giving a wide framework of knowledge and practical skills of the inhabitants. Radiocarbon dates will allow to refine the chronology.

The results will establish a solid starting point for the study of Final Pleistocene-Early Holocene settlement and economy on a regional basis and on diachronic perspective, filling the chronological gap recorded in Ethiopia from 24 to 8 kya BP, as attested in the southeastern Ethiopian LSA site of Goda Buticha (Tribolo et al., 2017).

4 **FUNERARY ADORNMENTS FROM THE ROMANIAN CHALCOLITHIC: OBJECTS FOR THE LIVING OR THE DEAD?**

**Abstract author(s):** Margarit, Monica (Valahia University of Targoviste)

**Abstract format:** Oral

It is generally accepted the assertion according to which the funerary adornments play a primordial role in the recovery of information with social or cultural character. Starting from adornments discovered in some Chalcolithique necropolises located in the south-east of the Romania, we aim to find out based on microscopic studies if the adornments present in the graves preserve use-wear marks, which would be the proof that they were/were not created exclusively to be deposited as funeral inventory. Most of the pieces from funeral contexts were made from exotic raw materials, especially from the Spondylus valve. It has been transformed into various typological categories: bi/trilobed beads, tubular, fusiform and biconvex beads, various pendants, buttons, belt elements, bracelets, perforated plates. The funeral inventories are completed by tubular beads from the scaphopod shells. Regarding the local raw materials, we can mention perforated plates made of *Sus sp.* tooth or necklaces from *Lithoglyphus naticoides* perforated shells. Following this analysis, it is clear that the funerary artifacts has an advanced degree of use-wear, demonstrating that the items were worn before their deposition in graves, either sewed on clothes or put together in necklaces or bracelets. Another important observation related to the studied archaeological assemblages is the variable degree of use-wear of pieces from the same archaeological contexts and the fact that items copied from other raw materials appear (when the original raw material was difficult to obtain), proving that the lost/broken pieces were progressively replaced, which is a concern to keep the composite ornaments intact throughout the bearer's life.

Acknowledgments

This work was supported by a grant of the Ministry of Research and Innovation, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2016-0182, within PNCDI III.

5 **UNWINDING THE BEADS OF FIRST MILLENNIUM BC ABRUZZO (ITALY): RECONSTRUCTION OF GLASS BEAD BIOGRAPHIES THROUGH USE-WEAR ANALYSIS**

**Abstract author(s):** Montanari, Eleonora (Newcastle University)

**Abstract format:** Oral

Among the earliest objects crafted from hot glass, beads reveal exciting stories about the people who made, owned and possibly curated them. Due to the artificial nature of glass, properties such as colour, opacity and durability of the beads largely reflect intentional choices, which are regulated by the technological know-how and belief systems of a given past or present society. Glass beads are portable and versatile. Throughout their life cycle they can be arranged multiple times in a variety of fashions to form necklaces, bracelets, earrings or garments. When part of a costume, they can act as markers of gender, age or social affiliation through visual codes.

First millennium BC glass beads retrieved from female and child burials in the cemetery sites of Campovalano, Fossa and Bazzano (Abruzzo, Italy), have been traditionally interpreted as mere ornaments, skewing the picture towards male, martial and elite identities. The intrinsic symbolic properties of these beads, their production processes and life histories have been overlooked, with previous research mostly focusing on typology. The way beads were crafted and used can provide us with a glimpse of their importance in the construction of identities - in life and death - in ancient societies.

This research intends to redress the imbalance by attempting to reconstruct the life history of the beads and to assess whether their use in death reflects the ways they were used in life. I shall illustrate the methods and partial results obtained from qualitative and quantitative use-wear analysis carried out on replica bead sets and on archaeological beads retrieved from burial sites in Abruzzo. Results are interpreted through the wider lens of production chaînes opératoires, funerary archaeology, and ethnography.

6 **REWIND THE TAPE. FROM TOOL TO THE ACTIVITY: QUESTIONS OF SPECIALIZATION IN THE IRON GATES DURING MESOLITHIC AND EARLY NEOLITHIC**

**Abstract author(s):** Petrovic, Andja (Sapienza University of Rome; University of Belgrade) - Nunziante-Cesaro, Stella (Scientific Methodologies Applied to Cultural Heritage - SMATCH, ISMN-CNR c/o Dept. of Chemistry, Sapienza University of Rome) - Lemorini, Cristina (Sapienza University of Rome)

**Abstract format:** Oral

The main idea of this paper is to represent how use-wear and residue analysis can help in the interpretation of sensitive archaeological question as defining the transitional period from Mesolithic to Neolithic and its characteristic in the central Balkans.

The Iron Gates region is a very specific eco-niche that helped researchers understand how advanced communities of local hunter-gatherer fishermen, together with incomers from Central Anatolia, organized their settlements, daily life, how did they feed, what did they hunt, what and how did they produce different objects.

Use-wear and residue analysis are often considered as an additional study that can help or improve the knowledge about the use of prehistoric tools, but they are the key to understanding the activities that took part. What is left from the prehistoric periods is what we see in the exhibitions, what is stored in the laboratory or museum depot nowadays, material culture in general. However,

functional analysis can reveal the processes behind it and place the mentioned artefact in the scenery, in other words, it can put the tool, again, in the hand of prehistoric people.

Based on the data of preliminary use-wear and residue analysis from Lepenski Vir and Padina site we will discuss the economical strategies and possibility of the groups specialization in the Iron Gates during the Late Glacial and Early Holocene. How can we trace skills? How to define specialized activities carried out in equalitarian Meso-Neolithic societies? Is there a connection between the recycling behaviour observed at these sites and the production of specific materials or goods? Was the possible specialization only focused on the region or also outside of it?

7 **BONE TOOLS FOR MINING AND ORE-PROCESSING (EASTERN EUROPE)**

**Abstract author(s):** Zagorodnia, Olga (Independent researcher)

**Abstract format:** Oral

Bone tools are present in the toolkit of metalproduction sites over a wide area during the Bronze Age. Most frequently, researchers associate them with ore mining due to the contextual presence in ancient mines and the typological proximity to bronze wedges. The assemblage of the sources related to metalproduction from the Kartamysh sites in Donets Basin (Eastern Ukraine) critically posed the problem of the purpose of bone artefacts in this field. Kartamysh archaeological area included the settlements, the sites for ore-sorting and processing, copper mines and open pits which were exploited during the Late Bronze Age (XVI-XIII BC). In order to verify the functions of archaeological bone tools we carried out experiments using similar replicas in a variety of operations. Traces on the artefacts were identified in comparison with experimental items associated with argillite mining; loosening a layer of crushed copper sandstone; processing copper ore by washing its fine fraction in a leather container (a gravitational process). As a result, a new functional type was singled out – tools for mixing ore in gravitational process (total 399 items). They were made from ribs, scapulas, and long bones. The functional type of scoops for raking ore made from animal scapulas and pelvic bones (10 items) was also identified. The formed database on deformations and wear traces is suitable for comparing sets of tools in general and their individual parameters with similar information from other ancient mining complexes. Tools from ribs and scapulas, found in the mines of the Late Bronze Age near Mikhailo-Ovsianka (Samara region, Russia) and at the Kargaly sites in the Urals were similar to the Kartamysh ones regarding their morphological features. At the same time, rather peculiar wedges from tubular bones, which are numerous in the ancient mines in the Urals, were missed on the Eastern Ukraine sites.

8 **AN INTEGRATED APPROACH TO INVESTIGATE THE FUNCTION OF A CERAMIC BASIN DIFFUSED IN THE PRE-DYNASTIC LOWER EGYPTIAN SITES (4TH MILL.BC)**

**Abstract author(s):** Caricola, Isabella (Newcastle University, School of History, Classics and Archaeology) - Bajot, Jade (UMR-5608 TRACES Université de Toulouse 2 - Jean Jaurés Maison de la Recherche Bat 265) - Medeghini, Laura (Department of Earth Sciences, Sapienza University of Rome) - Vinciguerra, Vittorio (DIBAF, University of Tuscia) - Forte, Vanessa (Laboratory of Technological and Functional Analyses of Prehistoric Artefacts - LTFAPA, Sapienza University of Rome)

**Abstract format:** Oral

This presentation will focus on the preliminary results obtained from the functional analysis of a peculiar oval shaped basin diffused in the Lower Egyptian predynastic sites during the first half of the 4th millennium BC and on the importance of the introduction of such a multidisciplinary approach in the domain of the Egyptian archaeology.

These oval shallow ceramic basins are characterized by a flat and wide inner surface covered by a layer of small rock fragments pressed into the clay matrix. Several archeologists interpreted them as grinding tools, but the limited number of samples unearthed so far, their bad state of preservation and the lack of archaeological comparisons made the interpretation uncertain. We have therefore decided to put in place a multidisciplinary protocol based on petrographic, use-wear and residue analyses carried out on two samples from the predynastic site of Maadi (Egypt), combined with experimental archaeology. The use-wear analysis of the archaeological fragments highlighted traces of an intentional grinding and light pounding of oily substances, also partially supported by the GC-MS investigation. These results were tested through experimental trials that confirmed these basins to be likely mortars.

Establishing the actual use activities performed in such a peculiar type of vessel plays an important role in reconstructing the characteristics of the Lower Egyptian Culture, and in understanding the social behaviors of these communities and the dynamics related to the diffusion of such basins.

Finally, this research was also an opportunity to test this integrated approach and to set the stage for future projects, providing a new methodological framework for the Egyptian Predynastic studies.

9 **SOCIAL DYNAMICS RELATED TO THE TREATMENT OF CEREALS IN AN EARLY BRONZE AGE VILLAGE: THE CASE OF ARSLANTEPE VI B2**

**Abstract author(s):** De Angelis, Antonella - Lemorini, Cristina (Sapienza, University of Rome)

**Abstract format:** Oral

The interpretation of the social organization in an archaeological settlement cannot be separated from the analysis of the activities that were carried out in it, the way they were practiced, the management of the spaces and the individuals involved in them.

This work aims to shed light, through the application of the use-wear analysis, on the different modes of processing cereals in a



Near-East Early Bronze Age farmer’s village (Arslantepe period VI B2, Eastern Anatolia) with no apparent internal hierarchy.

The settlement consists of a small residential units built along a slope on the exterior of a monumental fortification wall. In the village there are various macro-lithic tools including grinding slab and grinder which indicate a probable widespread grinding activity. These houses, made up of rectangular rooms, almost always have one or two large central rooms around which is a smaller one. At times there is another small room with a large domed oven. In the north-western area of the village there are rooms and spaces that seem to represent a common area, with ovens. At the end of this period, the settlement was violently destroyed by a fire that sealed structures and artefacts in situ.

A sample of macro-lithic tools from two different inhabited spaces, one relating to the main room of a house and another from a small room abutting to the northern wall characterized by the presence of a large oven will be compared and integrated with the published data coming from other related analyses, with the aim to understand if an activity of primary importance like that of cereal processing was practiced only at the household level or if it represented a “social binder” (collective o shared activity).

10

PITHOI AND RESIDUE ANALYSES IN THE LATE BRONZE AGE SOUTHERN ITALY

**Abstract author(s):** Porta, Francesca (no affiliation) - Vanzetti, Alessandro (La Sapienza-Università di Roma) - Ribechini, Erika (Università di Pisa)

**Abstract format:** Oral

Since the Italian Recent Bronze Age (13th-12th century BC) a new ware, the wheel-made pithoi produced with levigated clay, made its appearance in the indigenous contexts of Southern Italy. On one side their production implies pivotal technological innovations, on the other, the core importance of this pottery class lies in its socio-economic implications. Pithoi were, indeed, likely used to store huge amounts of primary goods fundamental for the survival and social relations of the indigenous communities of Southern Italy. In fact, their use became more widespread in the last centuries of the second and at the start of the first millennium BC (Final Bronze-Early Iron Age).

The investigation of the storage systems, nowadays, cannot disregard the use of residue analyses; the identification of the substances stored is fundamental in the comprehension of the storage strategies applied by ancient communities both at household and supra-domestic levels. The present paper aims, therefore, to connect the results of residue analyses carried out on some pithos fragments retrieved in the site of Broglio di Trebisacce (CS, Calabria) with contextual data.

The final aim of the paper is to gain a deeper insight into the management of resources in Late Bronze Age Southern Italy and to explore its implications in the socio-economic frame of the local communities.

11

FUNCTIONS OF EARLY IRON AGE HANDSTONES. EXPERIMENTAL AND TRACEOLOGICAL APPROACH

**Abstract author(s):** Kufel-Diakowska, Bernadeta - Baron, Justyna (University of Wrocław) - Buchner, Aneta (Polish Academy of Science) - Lipert, Michał - Ziewicka, Izabela (University of Wrocław)

**Abstract format:** Oral

The multi-faceted analyses proved that the community of early Iron Age settlement (7th century BC, so-called Lusatian culture) at Milejowice in SW Poland used easily accessible, unworked erratic pebbles of similar shapes for various purposes. Referring to the results of our experimental work, we examined a collection of 46 stone objects made from sandstone, quartzite and granite, found in various contexts: storage and settlement pits, wells and cultural layer. Using microscopic analysis of use-wear, we identified the handstones for grinding grain and plant stalks and also used for pottery production (grog obtaining) and decoration (red pigment powdering). Erratic pebbles were selected by their shape, size, and weight. Some of the handstones served for only one purpose, while the other might have been used to process both hard and soft materials. The distribution of the handstones in the settlement area showed that they were strongly associated with household activities which included both food processing and pottery manufacturing.

These spherical implements made from weathered, easily damaged erratic pebbles, selected by their size not by the type of rock, were parts of a basic tool kit of each household and could not be replaced by other raw-material. Handstones were necessary to survive for each family, who produced food and vessels, such as in Milejowice case. At this unique site, with exceptional enclosures, empty spaces between particular groups of houses, as well as metallurgical workshop and prestige pottery, we can see that the society remained conservative using optimal but traditional tools and techniques. The case of Milejowice show that beside hi-tech technologies requiring training and skills, such as glass or copper production, in a considerable part of elementary activities people needed expedient tools made from easily accessible material, that did not require any preparation and could be simply abandoned.

12

UNDERSTANDING DEPOSITION PRACTICES AT TEPECİK ÇİFTLİK (TURKEY) THROUGH USE-WEAR ANALYSIS

**Abstract author(s):** Vinet, Alice (Université Paris 1 Panthéon Sorbonne)

**Abstract format:** Oral

Tepecik Çiftlik is located in Cappadocia (Turkey), a few kilometers away from obsidian sources. The mound was inhabited from the Late PPNB to the Early Chalcolithic, from the beginning of the 7th millennium to the beginning of the 6th millennium.

Deposits and caches are quite frequent at Tepecik throughout the entire sequence. They are all different, they contain a great va-

riety of artefacts and are located in various places. Some deposits are situated under the floor of a room, some are sealed by slag-stones, and some are located on the floor level. One exceptional deposit fill an entire room. The BY space is part of a larger house occupied during the transition between the Late Neolithic and the Early Chalcolithic and is dated to ca. 6100-5900 cal. BC. Many exceptional artefacts were found in situ on the floor, mainly highly decorated pottery and large chipped stones. The BY space was interpreted as a storage area as empty silos were found inside the room. However, the use-wear analysis of the lithic objects and the technological study of the pots suggest a different scenario. The lithic tools correspond to a toolkit used in daily activities, but the decorated pots are unusable.

This communication focuses on the interpretation of such clusters of materials through an interdisciplinary approach. The combination of lithic technology, lithic use-wear, pottery technology, pottery typology and stratigraphy is necessary to understand the deposition practices at Tepecik Çiftlik. Moreover, it raises questions about social organization and ritual practices.

13

USING INTERDISCIPLINARY APPROACHES TO UNDERSTAND THE FUNCTIONALITY OF EARLY BRONZE AGE STONE BATTLE-AXES AND AXE-HAMMERS; REMOVING LACUNAS IN RESEARCH

**Abstract author(s):** Roy, Amber (Newcastle University)

**Abstract format:** Oral

Previous understandings of northern British prehistoric battle-axes have often surmised that these objects were non-functional symbols of power, too fragile to be functional, or purely symbolic objects, perhaps of a warrior elite. Older assumptions have also argued for their use as weapons. While the use of axe-hammers has been disregarded due to their large size. Such interpretations were based on unreliable and stereotypical assumptions using modern preconceptions. This paper presents the first large scale application of wear analysis and experimental archaeology on British Early Bronze Age battle-axes and axe-hammers, from Northern Britain and the Isle of Man. The data establishes a vital understanding of the uses and related social interactions of these previously enigmatic artefacts; thus, debasing past interpretations. As such, the paper demonstrates the significant breakthroughs that can be achieved when applying these complementary interdisciplinary methods to answer lacunas in research and breakdown the dated interpretations which significantly limit the accuracy of our research.

14

RESEARCHING THE “DAGGER IDEA” IN PREHISTORIC EUROPE: NEW PERSPECTIVES FROM EXPERIMENTAL ARCHAEOLOGY AND USE-WEAR ANALYSIS

**Abstract author(s):** Caricola, Isabella - Dolfini, Andrea (Newcastle University)

**Abstract format:** Oral

The dagger is one of the most widespread and iconic objects of late Neolithic and early Bronze Age Europe. Made from either stone or metal from the 4th millennium BC, daggers were manufactured, used and exchanged by most European societies until the mid-2nd millennium BC, and occasionally later. Despite being ubiquitous and clearly important for the reproduction of prehistoric society (as shown by their frequent placing in burials and hoards), early daggers have never been targeted by wide-ranging, interdisciplinary studies integrating functional, experimental, and social analysis. As a result, we do not know what daggers were made for, how they were used, and what they meant to prehistoric society, if indeed they had a single meaning and function at all. “Euro-Dag”, a Marie Skłodowska-Curie Individual Fellowship hosted by Newcastle University (UK), is answering these questions through integrated use-wear analysis and experimental archaeology. The paper presents preliminary results of the research. It discusses (1) the creation of a reference collection of use traces on both stone and copper-alloy replica daggers by means of functional tests including cereal harvesting, butchering and combat; and (2) preliminary use-wear analysis of both stone and copper-alloy archaeological daggers from Italy and Ireland. These data shed new light on the relationship between lithic and metal daggers in prehistoric Europe, thus contributing a new understanding of the meaning, biographies, and social significance of these objects in a cross-material and cross-cultural perspective.

15

BRONZE AGE SWORDS FROM BOHEMIA. EXPERIMENTAL USE AND FORMATION OF COMBAT TRACES

**Abstract author(s):** Havlíková, Markéta (Masaryk University) - Ježek, Josef (University of West Bohemia)

**Abstract format:** Oral

How the bronze weapons were used is still a valid question in European archaeology of Bronze Age. Plentiful findings of various traces of use on weapons demonstrate not only their practical use, but also the diversity of their use in combat. Warfare was a crucial part of society and was involved in forming structures in prehistoric Europe. The way and form of combat is, therefore, an important aspect of recognition of this social interaction. The use-wear analysis methods are becoming an independent/separate field of study in Czech Republic and are more frequently involved in studying bronze artefacts. The aim of this poster is to illustrate the potential and results of experimental archaeology in combination with use-wear analysis for understanding the Bronze Age swordsmanship. Bronze swords from Bohemia wear traces of practical use, and our interests were mainly to find out the approximate method of their practical use and attempt to interpret the different types of traces. Based on metallographic analysis, replicas of bronze swords were made then used in a controlled environment (the origin of every trace was recorded) and later on in the swordfight simulation experiment. This poster presents the progress and preliminary results of our experiment, and above all discusses the relationship between specific combat movements and types of traces.



- a.

EXPERIMENTAL AND TRACEOLOGICAL STUDY OF THE CHISELS MADE OF ANTLER FROM THE TERRITORY OF NORTH-WESTERN BELARUS

**Abstract author(s):** Malyutina, Anna (Institute for the History of Material Culture; The Laboratory of the Experimental Traceology) - Vashanau, Aliaksandr (Institute of History of the National Academy of Sciences of Belarus; Department of archaeology of Prehistoric Society) - Tkachova, Maryia (Institute of History of the National Academy of Sciences of Belarus)

**Abstract format:** Poster

Our report will present the results of experimental and traceological analysis of the chisels made of antler (*Alces alces* L.) obtained as a result of the collections from the 1960s – 1990s from the site near the village of Michnievičy Smorgon district of the Grodno region (North-Western Belarus). The largest part of the collection refers to the period of the Late Mesolithic – Early Neolithic. At the first stage of work, the most expressive and numerous group of artifacts made of antler (24 ex.) were selected for a techno-morphological analysis. Analysis of the technological traces recorded on the items allowed us to highlight the differences in the manufacturing processes of the tools. According to technological and morphological features, the whole of the analyzed material was divided into conditional categories of instruments with a selected “heel” and without it. The presence or absence of this element, apparently, influenced the method of using objects in various household situations. In addition, on the basis of the macro signs of utilitarian wear observations on the functional using of objects were obtained. A series of experiments were conducted to reliably verify the traces of use recorded on artifacts. It was found that the choice of raw materials, a specific part of the elk antler, was deliberate for the manufacture of tools of this type. Established standards for the manufacture of tools with a set of certain functional characteristics indicate a strict specialization of this category of tools. It can be assumed that the functional specialization of the antler chisels of this type was preserved in other territories where these items were found (for example, in the Baltic States and Western Russia), which may indicate a wide spread of elk antler processing skills in communities of the late Mesolithic - early Neolithic period.
- b.

WITHOUT A TRACE? THE POTENTIAL OF MODERN RESTORATION METHODOLOGIES FOR RESURFACING TRACES ON HEAVILY CORRODED METAL OBJECTS

**Abstract author(s):** Greiff, Susanne - Eckmann, Christian - Lehnert, Ruediger (Roemisch-Germanisches Zentralmuseum Mainz, Leibniz-Research Institute for Archaeology) - Schwab, Roland (Curt Engelhorn Zentrum Archäometrie Mannheim) - Bach, Detlef (Detlef Bach Restaurierung Archäologischer Bodenfunde) - Thaler, Ulrich (Roemisch-Germanisches Zentralmuseum Mainz, Leibniz-Research Institute for Archaeology)

**Abstract format:** Poster

The lifecycle of an object leaves different traces each offering insight into a specific phase of its “biography”. Compared to lithic objects, metals are much more affected by surface alteration with a pronounced influence on mechanically induced marks, with long-term burial in soil undoubtedly having the strongest impact on these features.

Some mechanical or chemical restoration treatments severely modify or destroy these traces. The development of more controlled procedures during the last 35 years and the concept of the ‘original surface’ has contributed to a paradigmatic change with the preservation and documentation of remnants and traces as the core idea. The modern approach is to expose the fossilized traces that are hidden within the mineralized corrosion layers. This is in contrast to dismantling the piece down to a metallic core or to shape the corrosion layer regardless of the ancient surface. Many traditional mechanical preparation methods were invasive in a way that their application involves an interpretative shaping according to the idea of the outline an object should have driven by examples of topologic analogues or aesthetic demands within a museum environment. The development of microscopically controlled abrasive blasting using a choice of different kinds of micro-particles and instrumental settings tailored to the physical condition of the corrosion type allows the preparation in a way that the original surface controls the mechanical cleaning effect and not vice versa.

We aim to illustrate (with a short film amongst others) the potential of modern restoration technologies for recovering traces by taking iron objects as an example, as iron represents the archaeological metal most susceptible to corrosion, developing voluminous agglomeration crusts of soil and corrosion products. We hope to encourage researchers to exploit the potential of heavily corroded materials such as archaeological iron objects for traceology studies and foster inter-disciplinary approaches.
- c.

COMPOSITE BONE PROJECTILE POINT FROM BYTNIK (SW POLAND)

**Abstract author(s):** Kufel-Diakowska, Bernadeta (University of Wrocław) - Diakowski, Marcin (Archeoreplica) - Miazga, Beata (University of Wrocław) - Łucejko, Jeannette - Ribechini, Erika (University of Pisa)

**Abstract format:** Poster

Composite bone tools belong to the very rare finds from the Eneolithic, particularly in the area of the Central Europe. Among the osseous artefacts, some of the sites yielded short bone points and other small bone rings of unknown function. We present the unique find that enable to give interpretation of such kinds of artefacts. The completely preserved spindle-like bone projectile point, almost 15 cm long, and the flat bone ring glued together with the use of wood-tar come from the Pre-Roman site no 6 at Bytnik (SW Poland) excavated in 2009-2012 preceding construction of a gas pipeline. The bone implement was found at the bottom of the deep trapezoidal pit that yielded a few Pre-Roman sherds, more than 400 pieces of pottery dated to Funnel Beaker Culture, 5 other bone tools and flint flakes. The radiocarbon date of the bone point is of 4410±35 BP (3321-2915 BC). Multi-faceted analysis that

- d.

SOLUTREAN POINTS OF COVA ROSA (RIBADESELLA, SPAIN): TECHNO-TYPEOLOGICAL AND FUNCTIONAL ANALYSIS

**Abstract author(s):** López-Tascón, Cristina (Universidad de Oviedo) - Álvarez Fernández, Esteban (Universidad de Salamanca) - Jordá Pardo, Jesús F. (UNED, Madrid)

**Abstract format:** Poster

The Cova Rosa site (Ribadesella, Spain) is a cave that has been excavated during three archaeological stages. The first one was developed by prof. Jordá Cerdá in the fifties, a second has been made by the same researcher and Alejandro Gómez Fuentes in the seventies and eighties, and finally, a third that since 2012 is being carried out by a team of the University of Salamanca. Within its stratigraphy, among its Solutrean levels, which occupy the 6th, 7th and 8th layers, there is a set of shouldered points and concave base points made of flint, quartzite and radiolarite.

In this work, a study has been carried out that included a techno-typological analysis and use-wear analysis of these solutrean points, paying attention to both the macro and microscopic traces. In addition, special emphasis has been placed on the fractures of the points in order to evaluate the potential use of such tools as projectiles.
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THE EXCHANGE OF PLANTS AND FOOD PRACTICES THROUGH THE NEOLITHIC PERIOD TO IRON AGE

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Jesus, Ana (Integrative Prehistory and Archaeological Science - IPNA/IPAS, University of Basel) - Prats, Georgina (Integrative Prehistory and Archaeological Science - IPNA/IPAS, University of Basel; Grup d’Investigació Prehistòrica, Departament d’Història, Universitat de Lleida) - Alonso, Natàlia (Grup d’Investigació Prehistòrica, Departament d’Història, Universitat de Lleida) - Tereso, João (InBIO- Research Network in Biodiversity and Evolutionary Biology; CIBIO - Research Center In Biodiversity and Genetic Resources/University of Porto; Centre for Archaeology. UNIARQ. School of Arts and Humanities. University of Lisbon; MHNC - UP - Natural History and Science Museum of the University of Porto)

**Format:** Regular session

Networking is an ever-present characteristic of human societies. Not only humans move but also objects, ideas, symbols, taboos, food practices, since culture and identity play their part regardless of the movement of a person or an idea or object. For a long time, “networking” has reflected long-term cross-cultural interactions between food plant resources and people. Studies of agricultural process indicate similarities and confirm the established exchanges between societies in wide geographic areas.

How to recognize and identify routes of ideas and exchange related to plants and to different food processing steps? The distribution of introduced plants serves as an excellent proxy for the study of exchange along with its cultural consequences.

The main aim is to identify social and economic interactions and cultural connections between societies across south and central Europe. Europe has always been a continuous interface between different exchange routes. This session also invites researchers from islands to understand whether they were connected, interconnected or isolated from the continental exchange routes. We intend to present an overview of the dynamics of innovation, continuity, influences, and the spread of food processing, in all the stages of the agricultural system.

This session invites those presentations and posters focused on archaeological contexts from the Neolithic to the Iron Age which addresses the following themes:

  - Exchange networks of agricultural tools and cooking objects.
  - Can storage and storage facilities be related to exchange routes?
  - How processed and unprocessed foods were exchanged during prehistory.
  - What type of archaeological data is particularly suitable for network analyses when discussing food practises in the prehistory.
  - Theoretical models which enable new ways of thinking about food practices in the European Prehistory.
- ABSTRACTS

1

THE ROLE OF EXCHANGE IN CROP DYNAMICS IN THE NW MEDITERRANEAN AREA AND THE SWISS PLATEAU DURING THE NEOLITHIC PERIOD

**Abstract author(s):** Jesus, Ana (Integrative Prehistory and Archaeological Science, University of Basel) - Bouby, Laurent (Institut des Sciences de l’Evolution - ISEM; Université Montpellier) - Antolín, Ferran (Integrative Prehistory and Archaeological Science, University of Basel)

**Abstract format:** Oral

Several studies hypothesize patterns on crop dispersal routes but not on the process of crop exchange. Instead of focussing on the spread of domestic crops, in this paper, the focus is on what happens after the first crop arrival, contacts and how can we study it

by using the exchange approach. In order to reconstruct the organization of exchange in its contexts, it is needed to know points of arrival and outline the spatial patterns of the exchanged material. These two steps were applied to archaeobotanical data from the NW Mediterranean area and on Swiss Plateau as an approach to understand how domestic plants arrived beyond the Alps. The paper aims to show that even with the limitations we have under the current state of research, archaeobotanical data can be used to propose crop exchange networks in the Neolithic period and that this is an essential type of analysis in order to understand agricultural decision-making in Prehistory.

2 **STORAGE PITS MORPHOLOGY: SEARCHING FOR CHANGES, PATTERNS AND INTERACTIONS OVER THE NEOLITHIC PERIOD IN WESTERN EUROPE**

**Abstract author(s):** Prats, Georgina (Integrative Prehistory and Archaeological Science - IPNA/IPAS, Dept. of Environmental Sciences, University of Basel; Grup d'Investigació Prehistòrica, Departament d'Història, Universitat de Lleida)

**Abstract format:** Oral

Among the numerous preservation strategies developed over time, this study focuses specifically on the underground silo. The silos, although not exclusive, are the most common type in the Mediterranean area due to their better chances of conservation and their frequency in open-air sites. From the technical viewpoint, one of the aspects most often considered by researchers concerning these features is morphology. Thus, this is the only type allowing a large scale quantitative analysis of the criteria of silo morphology as a cultural indicator.

Traditionally, the choice of one form of silo pit or another is one of the issues most often dealt with by researchers who investigated prehistoric storage. Silo morphology has been linked to the type of geological substrate and, the finality of the stored product. Silos have also been interpreted as cultural, technical and technological features. Furthermore, it is worth highlighting the symbolic element of new techniques acquired by primitive societies. Hence, digging an underground silo must also be considered in this framework as its shape potentially comply with standardised social norms. Their construction is therefore not random, nor are they always designed to maximise efficiency.

In the Neolithic period, there is evidence of changes in the morphology of underground silos. On the other hand, it is noteworthy to emphasise morphological diversity throughout all the phases. So what is behind these differences? Can geographical and chronological patterns, and technological exchanges among cultures be found? Can the dominant shapes during a phase in broad areas demonstrate that their forms can be linked both to wide-ranging cultural phenomena? The main objective of this work is to examine how the underground storage pits change their morphology over the earliest agricultural communities of the Neolithic period (c. 5600-2300 BC) and to identify social interactions and cultural connections between societies of Western Europe.

3 **REGIONAL IDENTITY AND WINE STORAGE: AN EXAMINATION OF THE TRICKLE PATTERN MOTIF ON CRETE FROM EARLY TO LATE BRONZE AGE**

**Abstract author(s):** Oberlin, Lauren (University of Michigan)

**Abstract format:** Oral

The trickle pattern motif indicative of the Bronze Age period of Crete continuously appears on ceramic vessels from Early Minoan I (3500-2900 BCE) through Late Minoan III (1250-1100 BCE). First appearing in large quantity at Myrtos Phournou Korifi in Eastern Crete in the EM II period (2900-2200 BCE), the dark-on-light trickle decoration continues in use for 2,500 years through the end of the LM IIIB on Crete. This motif, depicting a red, brown, or black liquid trickling down from the top of a vessel seems to have been most affiliated with wine, an easy correlation due to semiotics of the motif as a dark trickling liquid. At Myrtos, the decoration appears in use with vessels that contained wine and with storage and use of wine production centers, and the decoration appears commonly on pithoi and amphorae after the site's abandonment. Appearing in such palatial contexts as Knossos, Malia, Gournia, and Phaistos, the decoration is adapted to use for fineware feasting assemblages and singular cups and bowls while still in use on storage and transport vessels.

While this motif grows and wanes in popularity on Crete throughout the Bronze Age it has continuous expression in Eastern Crete, especially around the Mirabello Bay, and strongly indicates regional identity of a regional product – wine and its vessel storage and consumption. Appearing in settlement and cemetery, this motif has strong ties to utilitarian and ritual consummatory practices tying back to the production and storage of wine. Through this material and contextual analysis, I have created models of this decoration's expression throughout the Bronze Age on Crete as it shows the network of intra- and inter-regional interaction on Crete, and the complex role of city identity and palace trends as a network of complex interaction of plant-product and identity.

4 **MULTI-CROPPING AND SOCIAL COMPLEXITY: THE ROLE OF MILLET IN THE PROCESSES OF SOCIAL CHANGE (AMPURDÁN, CATALONIA, SIXTH CENTURY B.C.)**

**Abstract author(s):** Cebrián Martínez, David (University of Barcelona)

**Abstract format:** Oral

According to the data, the spread and arrival of Millet to the Iberian Peninsula was through the Pyrenees (Buxó and Piqué, 2008, 169). De facto, millet has been recorded, coupled with other crops, in the oldest stratigraphic units of the Early Iron Age main settlements of Ampurdán, Illa d'en Reixac and Sant Martí d'Empuriés (Castanyer et al., 1999, 107; Martín, 1998, 56).

This paper argues that the introduction of millet could have played, together with other factors such as a well-documented climate change and the beginning of colonial relationships with Mediterranean merchants, an important role in the evolutionary process that would give rise during the sixth century BC to the emergence of the Iberian Culture. In order to address the societal effects and complex causes behind the introduction of millet, the necropolis of Vilanera, contemporary of the aforementioned settlements, will be analyzed so as to shed light over the possible political consequences of what seems to be an important economic shift in the economy of subsistence. The latter is reflected in the layout of the grave yard and the typology of burials, of which stands out a tumulus, stone covered pits and burial pits with and without grave goods, which suggests a transformation of the social structure that could be, to a certain extent, related to multi-cropping.

5 **EXCHANGE AND SPREAD OF PLANT FOODS IN WESTERN MEDITERRANEAN DURING IRON AGE**

**Abstract author(s):** Alonso, Natàlia (University of Lleida) - Pérez-Jordà, Guillem (University of València) - Rovira, Núria (University Paul-Valéry Montpellier)

**Abstract format:** Oral

Throughout the first millennium BC the South and East of the Iberian Peninsula and the South of France will have a radical transformation in which phenomena such as urbanization, the appearance of new crops and the development of commercial agriculture will emerge. Somehow this end of the Mediterranean is integrated into an economic circuit that now involves the totality of this sea.

The processes of adopting new crops and techniques, as well as the integration of the different areas in this new model will be different. Arboriculture is going to appear at the beginning of the first millennium BC in the south of the Iberian Peninsula and from here it is going to expand towards the north. At the same time, different agricultural models will be generated, fundamentally in terms of market-oriented products. In the southern half of the IP, the cultivation of fruit trees and the production of derivatives such as wine and oil, which will largely be commercialised, are the most characteristic elements of the new model. On the contrary, in the NE of the Iberian Peninsula and in the South of France there are some areas where wine production is also relevant, but, in general, they are areas that are going to produce and export basically cereals.

It is in the different realities that are going to be produced in this territory, the exchanges that are generated between them and with other areas of the Mediterranean, as well as the integration or local development of technological innovations linked to agricultural production, the aspects that we intend to develop in this communication.

6 **A SENSE OF BELONGING: CROPS, STORAGE FACILITIES AND CULTURAL RELATIONS IN NE PORTUGAL IN THE IRON AGE**

**Abstract author(s):** Tereso, João (CIBIO - Research Center in Biodiversity and Genetic Resources, Univ. of Porto; InBIO- Research Network in Biodiversity and Evolutionary Biology; Centre for Archaeology. UNIARQ. School of Arts and Humanities. University of Lisbon; MHNC - UP - Natural History and Science Museum of the University of Porto) - Seabra, Luís (CIBIO - Research Center in Biodiversity and Genetic Resources, Univ. of Porto; InBIO- Research Network in Biodiversity and Evolutionary Biology)

**Abstract format:** Oral

Recent archaeological and archaeobotanical work carried out in Iron Age sites in NE Portugal uncovered a peculiar set of data that contrasts with what was previously known in other regions of Northwest Iberia.

Previous work in northern Portugal and Galicia (NW Spain) allowed a good characterization of the crops cultivated and consumed during the Iron Age. Contrasting with other Iberian regions, hulled wheats (*Triticum dicoccum* and *Triticum spelta*) were the main crops, followed by naked wheat (*Triticum aestivum/durum*), hulled barley (*Hordeum vulgare*) and millets (mostly *Panicum miliaceum*). Pulses are scarce and almost exclusively faba bean (*Vicia faba*).

However, recent work in the valley of the river Sabor (NE Portugal), allowed the acquisition of new data that suggest a different scenario. Despite massive sampling in some sites, hulled wheats seem to be absent and naked wheat clearly predominate. Furthermore, several elevated granaries were found in Late Iron Age sites such as Quinta de Crestelos and Castelinho. While this type of structures cannot be found in similar chronologies more to the West, they are much more common East from our study region.

Although we cannot, by now, dismiss we are dealing with a local phenomenon, we argue that differences in crop preferences and storage facilities are likely culturally driven and the result of a tighter connection of NE Portugal Iron Age communities with the Spanish Meseta (to the East) instead of the "Castros culture" to the west. Here we will explore this idea by addressing the archaeobotanical and archaeological record.

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EXPLORING LANDSCAPE EVOLUTION AND MATERIAL CULTURE'S IMPACT THROUGH INTERDISCIPLINARITY AND MULTI-MODELLING APPROACHES. NEW CHALLENGES IN ARCHAEOLOGY

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Castiello, Maria Elena (IAW, Institut für Archäologische Wissenschaften, Universität Bern) - Martínez-Grau, Héctor (IPNA - Integrative Prähistorische und Naturwissenschaftliche Archäologie, Universität Basel) - Morera, Núria (Departament de Prehistòria, Universitat Autònoma de Barcelona)

**Format:** Regular session

Nowadays, a strong interest in the recognition of past territories through the reconstruction of paleo-landscapes and the evaluation of the human impact is growing in the archaeological discipline. In this regard, the most recent studies have been conducted by interdisciplinary research teams, as the goals to achieve clearly lay beyond the frame of traditional archaeology. Therefore, biologists, geologists, geographers, etc. have started to work in conjunction with archaeologists in order to decode and highlight the human-environment interaction over time. Land-use simulation, population movements and material cultures investigations, by means of new high-performance technologies, have been major research topics in the last decades.

The simulation of the past human-environmental relationships relies on the analysis of diverse sources of information. On one hand, it deals with the excavation reports, classical textual archives, planimetric and naturalistic records. On the other hand, new quantitative methods -such as predictive modelling, machine learning, GIS, stable isotope analysis, XRF, automated object detection, etc.- have been currently applied for producing new information. This broad interest in multi-modelling approaches in landscape archaeology might be ascribed to advances made in technology and in the growing number of interdisciplinary projects.

This session aims to accommodate researchers, regardless of their study region or chronology, to show and share the methods and results of their interdisciplinary projects focused on human-environmental interaction. Therefore, communications oriented toward themes like the analysis of synchronic and diachronic settlement patterns, raw material exchanges, biological indicators of landscape evolution, diet of humans, animals and plant growth, in all their multiscale complexity, are strongly encouraged.

ABSTRACTS

1

EM-LIKE SOFT SEGMENTATION FOR ROMAN SETTLEMENTS DETECTION IN SWITZERLAND

**Abstract author(s):** Castiello, Maria Elena (University of Bern) - Ceré, Raphaël (University of Lausanne)

**Abstract format:** Oral

Spatial detection of object is a central issue in many disciplines as well as a major challenge in Archeology. Such settlements detection can be assisted by Computer Vision approaches which offer a large body of state-of-the-art research notably in content-based image retrieval using graph-based segmentation.

In the large family of segmentation methods, the main approach considers objects as resulting from the aggregation of similar or homogenous regions (nodes), according to their features dissimilarities (weighted edges) and their spatial relation.

Nowadays few formal researches in archeology seem to have exploited the aforementioned clustering framework for archaeological site detection (features similarities and spatial proximity).

The present study is an interdisciplinary research project that combines archaeological knowledge with geographical and statistical expertise. We deal with roman ascertained archaeological evidences in Switzerland characterized by their spatial location and essential descriptive information. We used those characteristics to clarify whether an unexplored region of the study area may or may not contain the remains of ancient civilizations. We embedded the evidences in a regular grid and generated a new collection of regions. Each region is related to a numerical or categorical variable (e.g. environmental features) and holding a relative importance (i.e. weights). In order to reduce the redundancy of information in the data used, only the factorial scores as Principal Component Analysis results, were retained as features. Regions with “Presence” or “Absence” label are marked nodes respectively in distinct two groups, otherwise assigned to a third group (“Unknown”).

We have developed a EM-like soft segmentation iterative algorithm to maximize the model likelihood and to avoid separating strongly contiguous regions. This approach aims to attain a soft segmentation e.g. a regional clustering. The visual output is a Suitability map showing the probabilities that each region belongs to the group Presence – Absence – Unknown of archaeological evidences.

2

STONE AGE MIGRATION PATTERNS AND TERRITORIALITY USING SIMULATION STUDIES

**Abstract author(s):** Spång, Lars (Umeå Univerrситy)

**Abstract format:** Oral

Villages consisting of semi-subterranean houses were common among hunter-gatherers throughout the circumpolar area during the Stone Age. Winter villages in northern Sweden show that territoriality was established by ca. 4500 BC (Lundberg 1997). Analysis suggests that each village consisted of a group of households and that each household utilized a territory ca. 500 square kilometers in size that was centered on a lake and its drainage system (Spång 2019). Archaeological data shows that moose and beaver were principal resources. Fishing, the hunting of birds and quarrying for lithic materials was carried out during the summer.

A simulation model was used to analyse the archaeological data from two territories in order to determine an optimal annual cycle and migration pattern for each household group within their respective river basins. A further simulation provided insight on how predation by both wolves and humans would affect the moose population. Moose almost went extinct during the Iron Age and the question arises whether the wolf was involved in this process.

The two simulations provide a benchmark for interpreting the archaeological data. GIS mapping of the migration patterns of moose has provided additional data used to estimate when and where moose moved in and between household territories.

The project has been carried out in collaboration with the Dept. of Wildlife, Fish and Environmental Studies at the Swedish University of Agricultural Sciences (SLU) in Umeå.

3

USING ENVIRONMENTAL PREDICTIVE SETTLEMENT CHOICE MODELS AS INPUT DATA FOR SETTLEMENT PATTERN SIMULATIONS

**Abstract author(s):** Sikk, Kaarel (University of Luxembourg)

**Abstract format:** Oral

Inductive models of archaeological site locations have been successfully used for predicting archaeological potential of places in landscapes. These models are mostly based on currently observable environmental information. To reduce environmental determinism and increase both explanatory and predictive power several variables like visibility of locations have been interpreted as social factors of settlement locations.

In the current paper we explore the possibilities of using inductive environmental models as input to simulation models of settlement pattern formation. Although similar to the ones created for predictive purposes they need to be designed with different considerations.

We present a study where we use inductive models of archaeological site locations to describe the spatial configuration of space environmentally suitable for residence. To do so we develop a conceptual agent-based model of residential choice based on discrete choice theory and theories of residential choice used in multiple fields from archaeology to contemporary urban studies.

We discuss the role of environmental influences as perceived in archaeological data and how they relate to social influences and historical processes leading to emergence of settlement patterns. We argue that spatial structures of the inductive models of specific settlement patterns can inform us about the causal processes behind them when experimented with agent-based simulations.

We present case study using inductive models of settlement locations from different periods of the Stone Age of Estonia. The differences of inductive settlement choice models and the ways of comparing them are discussed. The spatial configurations of the models of economic modes have different structures. For example region where settlements of water connected hunter-gatherers can be found has a different spatial structure than that of early agrarian communities. Those differences can give insights to socioeconomic choices through simulation experiments and can be used for explaining settlement pattern formation processes.

4

THE NATURAL AGRICULTURAL POTENTIAL (NAP) OF THE SOIL AS A PRIORITY? SETTLEMENT PATTERNS IN WESTERN EUROPE, CA. 5800-2800 CAL BC

**Abstract author(s):** Martínez-Grau, Héctor - Prats, Georgina - Jesus, Ana - Antolín, Ferran (IPNA - University of Basel)

**Abstract format:** Oral

Farming practices were the main economic engine for Neolithic communities at global scale. These communities, depending on their location, show different crop dynamics, specifically related to their available domestic crops. The management of these crops is clearly related to farmers' knowledge and technology available, but a very important factor is soils type. Previous approaches to soil characterization have used quantitative methods to measure soil adequacy for farming, including multiple proxies such as geographical, archaeobiological and archaeological of the land, to obtain areas of agricultural potential around prehistoric settlements.

In this presentation, we show a combination of these two approaches; and combine them with new proxies (such as storage capacity). On the one hand, we have compiled the carpological information, from dated and cultural defined levels, of the sites from the current NE Iberian Peninsula, SE France, N Italy and Switzerland (ca. 5800-2800 cal BC). We also have generated a GIS database of rasters with physical, chemical and climatic information for the territories mentioned above. From these we have elaborated a qualified and quantified map that reflect the NAP of the terrain. Lastly, we have confronted these two information sources and the dated sites to see if the NAP influenced where to settle and if the crop change is also reflecting a change in the settlement pattern.

a.

DALMATIAN FORTSCAPES: RECONSTRUCTING SETTLEMENT ECOLOGY THROUGH GEOSPATIAL MODELLING

**Abstract author(s):** Triozzi, Nicholas (UC Santa Barbara)

**Abstract format:** Poster

This paper investigates Late Prehistoric hillforts on the Dalmatian Coast of Croatia to better understand the role of habitat preference in territoriality behaviors and human settlement patterns more broadly. This research focuses on the variation in hillfort architecture investment using the total length of preserved wall features as a proxy for investment in the defense of agricultural resources. The dataset contains wall features of 139 confirmed and suspected hillforts occupied between the Bronze and Iron Ages



in Northern Dalmatia. Lengths of wall features and fortification style (e.g., ramparts, enclosures, islands, etc.) were determined using sub-meter satellite imagery and topographic maps. These variables are plotted against a series of covariates including defensibility indices, site elevation, viewsheds, and einkorn and emmer wheat growth suitability derived from soil, slope, and groundwater data. The analysis examines whether investment in hillfort construction (i.e., wall length) is predicted by the environmental variables. This paper will discuss the integration of geospatial analytics, crop ecology, behavioral ecology, and the archaeological record for assessing settlement patterns in Eastern Adriatic prehistory.

b. **TRACING A BRONZE AGE FARMLAND. THE CASE STUDY OF ŠKOFJA LOKA - TRATA, SLOVENIA**

**Abstract author(s):** Brezigar, Barbara (Avgusta d.o.o.) - Grahek, Lucija (Institute of Archaeology, ZRC SAZU) - Grčman, Helena - Turniški, Rok (Biotechnical Faculty, University of Ljubljana)

**Abstract format:** Poster

A large number of lowland settlements from the younger Bronze Age (15th–12th centuries BC) have been discovered in Slovenia in the past two decades. Archaeological studies of these sites have delivered a wide range of evidence about material culture, chronology and settlement structures on one side and almost no information about the economy and environment of these settlements on the other side. To tackle the lack of any zooarchaeological remains and paleobotanical residues, the excavation at newly discovered settlement on Trata in Škofja Loka was centred on obtaining the environmental data with pedological analyses. The poster will present the initial, auspicious results from this pedological examination.

On the area of the settlement, where we sampled for the physical and chemical analyses also two soil profiles were described. Soils have low pH (4,1 -4,5), very low base saturation and silty clay loam texture, so without fertilisation they have very low fertility, which is evident also nowadays. But in the second profile, on the north-east part of the Bronze Age settlement, a buried dark earth layer was found with increased amount of organic matter and much phosphorous (450 mg P205 kg-1), which could be an evidence of active (already prehistoric?) agricultural practices. Since the natural fertility of the soil is very low, most probably people improved it with addition of organic wastes.

c. **ARCHAEOBOTANICAL MATERIALS FROM ANCIENT ARABLE LAND: SOURCES AND DISTRIBUTION PATTERNS (ACCORDING TO COMPREHENSIVE STUDIES OF RESOURCE ZONES OF SETTLEMENTS)**

**Abstract author(s):** Babenko, Anna - Sergeev, Alexey - Korobov, Dmitry (Institute of Archaeology RAS, Moscow, Russia)

**Abstract format:** Poster

Resource zones of ancient agricultural settlements are mainly represented by arable land. The information capacity of these objects has not yet been fully estimated by researches, and is not limited exclusively to paleo-soils characteristics. Significant archaeological material from the arable land soils indicates the widespread use of not only organic fertilizers, but also household waste from the settlements to improve the soil fertility in the past. Along with ceramics, various types of carbonized archaeobotanical macroremains were inputted to the fields as part of the burnt debris: charcoal, carbonized straw, grains of crops and wild plant seeds, as well as fragments of burnt food or dung. In addition, soil horizons of ancient arable lands contain a large number of microremains: pollen, spores of coprophilous and phytopathogenic fungi, and micro-charcoals. If certain excavation and sampling techniques are followed, all these macro- and microremains can be extracted and studied.

The object of our research is the resource zones of archaeological sites of Late Bronze Age - Early Middle Ages situated in the Kislovodsk basin (North Caucasus, Russia). In the vicinity of ancient and medieval settlements, series of test trenches were laid along a regular network with 50 – 400 m step at different distances from the habitat zones. The large series of manual flotation of soil samples allowed us to identify certain patterns in the distribution of carbonized macroremains both in stratigraphic and planigraphic terms.

The results of the pollen analysis are largely consistent with the data of macroremains distribution. Pollen spectra of arable horizons do not reflect natural regional vegetation, but indicate a mixed sources of pollen in the soil, among which the introduction of organic waste and manure to the fields most likely played a significant role.

The investigation was supported by RFBR (No 18-09-00615).

d. **HUMAN IMPACT ON LANDSCAPE IN SMOLENSK REGION (WESTERN RUSSIA): A MULTIPROXY STUDY**

**Abstract author(s):** Lavrenov, Nikita - Ershova, Ekaterina (Lomonosov Moscow State University) - Nikolay, Krenke (Institute of Archaeology RAS)

**Abstract format:** Poster

Smolensk region is rich for archaeological sites of the last two millennia. It was of the major point on the trade route from the Varangians to the Greeks in middle ages. Modern landscape and vegetation of the Smolensk region was formed by human activities and climate conditions. The aim of our study is to reconstruct the history of vegetation in Smolensk region, to estimate human impact on the landscape and to find evidences of different waves of settlement in the region using pollen analysis, AMS radiocarbon dating and archaeological data. Now we present the reconstruction of the vegetation based on pollen analysis of sediments obtained from two sites. The first one is located among archaeological sites of different ages and cultures (including famous Gnezdovo). The second site is situated in 50 km to the West from the first (in about 10 km to the East from the Russian-Belarusian state

border) and distanced from known archaeological sites. The comparison of pollen diagrams allows to suggest that the landscape of the investigated area is dramatically transformed by agriculture activity in last two millennia. A peatland near Gusinskoe village (the second site) was supposedly appeared due to an anthropogenic fire associated with slash-and-burn agriculture. Slash-and-burn markers are also presented in sediments from the first site. Exact dates of the fires and shifts in vegetation composition we are planning to obtain soon. The study was funded by RFBR, project number 19-34-90172.

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**COLLAPSE IN THE BASIN: REGIONAL PERSPECTIVES ON THE 1500-1200 BC TRANSITION IN THE CARPATHIAN BASIN**

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Parditka, Györgyi (Museum of Anthropological Archaeology, University of Michigan) - Duffy, Paul (The Archaeology Centre, University of Toronto; The Italian Academy for Advanced Studies in America, Columbia University) - Szeverényi, Vajk (Déri Museum, Debrecen; Institute of Archaeology, Research Centre for the Humanities, Budapest) - Jovanović, Dragan (City Museum Vršac) - Molloy, Barry (University College Dublin)

**Format:** Regular session

The Carpathian Basin was an important conduit of people and material culture in the Bronze Age (2700/2500 - 800 BC). One of the major transformative periods in the Basin's history was the end of the Middle Bronze Age (MBA) and the beginning of the Late Bronze Age (LBA). Tell settlements, hallmarks of the MBA societies, were often important loci of trade and other activities. Yet at the end of the MBA, c. 1600-1400 BC, people abandoned tell settlements, social practices and political structures changed, and the archaeological record indicates the formation of new connection systems. Involving the latest regional results from settlement, mortuary, ceramic, isotopic and aDNA analyses, in this session we seek to better understand the new networks that emerge in the LBA, including the massive enclosed sites that appear in some parts of the Basin. We seek to better contextualise and connect the often fractious and regionalised understanding of LBA societies in this key zone of interaction in prehistoric Europe. Critical issues include how and what kind of changes may have occurred and whether migration played a role in socio-cultural change. We focus on the period between 1500 and 1200 BC because the dominant settlement networks seem to have declined along with regionalised pottery styles, and the emerging tradition incorporates a wide region sharing a broad family of channel-decorated pottery. The causes, scale, regionality, character and tempo of this transition remains unclear. We will evaluate claims over 1) population declines at the end of the MBA; 2) people arriving into the Carpathian Basin from elsewhere; 3) changes and continuities in social organization after the end of the MBA; 4) differences in social practices between MBA groups and people in these same areas after 1500 BC; and 5) the changing influence of interactions with networks beyond the Basin.

**ABSTRACTS**

1

**RECONSIDERING EARLY AND MIDDLE BRONZE AGE ABSOLUTE CHRONOLOGY IN HUNGARY**

**Abstract author(s):** Kiss, Viktória (Institute of Archaeology, Research Centre for the Humanities, HAS) - Csányi, Marietta (Damjanich János Museum) - Dani, János (Déri Museum, Debrecen) - Pusztainé Fischl, Klára (University of Miskolc) - Kulcsár, Gabriella (Institute of Archaeology, Research Centre for the Humanities, HAS) - Melis, Eszter (Várkapitányság Nonprofit Zrt.; Institute of Archaeology, Research Centre for the Humanities, HAS) - Szabó, Géza (Wosinsky Mór Museum, Szekszárd) - Szeverényi, Vajk (Déri Museum, Debrecen)

**Abstract format:** Oral

Present paper focuses upon the chronology of Early and Middle Bronze Age sites in Hungary based on the recent results of a research project granted by the Hungarian Scientific Research Fund and by the Momentum programme of the Hungarian Academy of Sciences. Both projects aim to complement the already available chronological information with recent AMS radiocarbon dating of human bone samples from several microregions in the central (Bell Beaker and Vatya style), as well as eastern (Maros, Füzesabony and Tumulus culture) and western parts of Hungary (Kisapostag, Transdanubian Encrusted Pottery, Gáta–Wieselburg culture). This work will provide more than 100 new AMS dates for the period between 2500 and 1500 BC upon completion, which is very important regarding the fact that most of former Hungarian Bronze Age dates were conventional radiocarbon dates, recovered from samples with mostly uncertain find circumstances.

The end of the Middle Bronze Age traditionally was dated between 1600 and 1450 cal BC. Our data sequence, however, shows a break around 1700/1600 BC; based on this an earlier dating of R Br B phase in Central Europe was already suggested by Philipp Stockhammer and his colleagues, as well as by Géza Szabó. Bayesian analysis of recently obtained data may get us closer to answering whether the break in the radiocarbon sequence reflects real historical processes or can not be connected to social changes and are due to methodological reasons (i.e. to plateaus appearing in calibration curve).

2

## AS SLOW AS COLD MOLASSES: CULTURE CHANGE FROM THE MIDDLE TO LATE BRONZE AGE IN THE LOWER KÖRÖS BASIN

**Abstract author(s):** Parditka, Györgyi (University of Michigan, Museum of Anthropological Archaeology) - Duffy, Paul (Archaeology Centre, University of Toronto) - Mengyán, Ákos (Castle Headquarters Integrated Regional Development Centre Ltd.) - Tynan, Justine (Metropolitan Museum of Art) - Godinez, Teresa (California State Polytechnic University, Pomona)

**Abstract format:** Oral

The end of the Middle Bronze Age around 1450 BC in the Carpathian Basin is usually characterized by population movements, the abandonment of the tell sites, changes in interregional networks, and the disappearance of certain mortuary practices and ceramic features.

Our paper focuses on this transition in the Lower Körös Basin in Eastern Hungary, where this narrative is not supported. While current data indicate that tell sites of this region were in fact left by 1450BC, the Békés 103 cemetery site suggests that the population and many traditions of the region remained stable. The most active use period of the cemetery falls between 1600 and 1280 calBC, a critical period where the orthodox view might anticipate drastic changes in cultural traditions.

We engage mortuary practices and ceramic stylistic analysis in a C14-based framework to address continuity and change in the customs of the burial community here. At low resolution, our analysis suggests that the Békés community held on until ca. 1300 BC to cultural traditions, which seem to change in other parts of the Basin around 1450 BC. Despite this, subtle changes are observable in both the mortuary treatment and in the use of design motifs, and possibly represent impacts from macro-regional trends. We argue that our study not only has relevant implications for ceramic based regional chronologies, but also offers cultural practice-based measures potentially useful for interpreting the tempo and regional character of the Middle to Late Bronze Age transition elsewhere.

3

## BEFORE THE RISE OF THE LATE BRONZE AGE MEGA FORTS IN THE LOWER MUREȘ BASIN (CA. 1600-1400 BC)

**Abstract author(s):** Gogaltan, Florin (Institutul de Arheologie si Istoria Artei Cluj Napoca; Universitatea de Vest din Timisoara) - Sava, Victor (Complexul Muzeal Arad)

**Abstract format:** Oral

The profound social transformations from the beginning of the Late Bronze Age (1600/1500 BC) in the region of the Tisa and the Lower Mureș Basin cannot be fully understood unless one turns back to the settlements and the metal items that had been characteristic to the Middle Bronze.

Seven multilayer sites with their secondary/satellite settlements, plus a considerable number of open settlements have been identified in this area. The tells were surrounded or separated by the rest of the terrace by one or more ditches, that in some cases were abandoned through the subsequent enlargement of the settlements in question. The ditches surrounded areas of between 0.5 ha and 1.3 ha, but together with the satellite settlement(s) the habitation centers covered areas of 4 to 8 ha.

Today, at least from a chronological perspective, the end of the lifestyle characteristic to the multistrata settlements can be set with certainty between 1600 and 1500 BC. Several reasons could explain their abandonment: violent events (outer attacks, fire), natural disasters (floods, draught, insect invasions, etc.), or internal factors (religious motivations or reasons related to hygiene, epidemics, the exhaustion of local resources etc.).

It is nevertheless certain that the Lower Mureș Basin was not depopulated by such unfortunate events. A significant number of new settlements and necropolises that continued the local cultural tradition have been attested. The older archaeological discoveries and especially the more recent one indicate a true demographic boom in the area beginning with the so-called Late Bronze II (1450/1400 BC). This is also one of the explanations for the onset of the mega-forts.

4

## PERSISTENCE AND TRANSFORMATION IN TRANSYLVANIA'S MINING LANDSCAPES

**Abstract author(s):** Quinn, Colin (Hamilton College)

**Abstract format:** Oral

The transition from the Middle Bronze Age to the Late Bronze Age in the Carpathian Macroregion was marked by the immigration of new communities from the Steppe and the rapid abandonment of local Middle Bronze Age cultural identities and practices. A new Bayesian radiocarbon chronology, however, suggests that southwest Transylvania followed a different trajectory. The Wietenberg Culture, Transylvania's Middle Bronze Age cultural identity, persisted into the Late Bronze Age for over 150 years in southwest Transylvania. Southwest Transylvania is a landscape rich in copper, gold, salt, lumber, and other resources that were critical to Bronze Age economies. Southwest Transylvania stands in contrast to surrounding regions, where current evidence suggests that Wietenberg identity was abandoned across other parts of Transylvania contemporaneously with the abandonment of Middle Bronze Age lifeways across the Carpathian Basin. In this paper, I argue that Wietenberg communities persisted in southwest Transylvania due to their unique position in a mining landscape with direct access to rich natural resources. While Wietenberg identities persisted in southwest Transylvania, these communities were neither isolated, nor insulated from the transformations that redefined interaction networks and sociopolitical hierarchy across the Carpathians. The disruption of interregional trade networks and movement of new populations into Transylvania spurred transformations that lead to the institutionalization of social hierarchy. Rather than marginalized along the peripheries, communities in southwest Transylvania were active participants in socioeconomic transformations

across the Carpathians during the Late Bronze Age.

5

## SOCIO-CULTURAL AND ECONOMIC TRANSFORMATIONS IN TRANSYLVANIAN LATE BRONZE AGE

**Abstract author(s):** Wittenberger, Mihai (National History Museum of Transylvania)

**Abstract format:** Oral

Transylvania is surrounded by the Carpathian arch. In this space, Wietenberg and Ottoman Cultures evolved during MBA (Middle Bronze Age), and, during LBA (Late Bronze Age), Noua Culture. Unlike on Tisei Plain and Pannonian Plain, where great agitation manifests itself and changes in the social organization, abandonment of tell occur, in Transylvania the situation is different. There is population contribution from northwest (Otomani), north (Cehăluț) and, most significantly, east (Noua). Without denying the importance of remaining elements from Middle Bronze cultures, Noua Culture becomes dominant. Although there are differences between communities, I don't think that cultural groups needed to be invented, but we can consider all the communities as a whole. At this moment there are 6 cultural groups only along Mures Valley, on 200 km. All these "groups" have (in common) Noua necropolises and typical Noua materials.

We can see that, after the penetration of Noua Culture in Transylvania, the number of settlements increases significantly, from 350 in MBA to over 600 in LBA, therefore also the number of inhabitants increased. With the arrival of the Noua Culture, major changes are taking place in the economy. Bronze is becoming commonplace, and new models of artefacts are spreading quickly: the Transylvanian socced ax, the rye with hook and the needle with protuberances. Processing technology does not change, but specialized sites on bronze production appear (e.g. Boldut, Cluj County).

In conclusion: in LBA the population increases numerically; life expectancy increases from 24 to 28/29 years; settlements continue to be unfortified; economic and cultural contacts extend from Aegean Sea to northern Europe. In other words, we are facing a period of progress and prosperity.

6

## THE LAST STAND OF THE MAROS GROUP: COLLAPSE IN THE MIDDLE BRONZE AGE

**Abstract author(s):** Nicodemus, Amy (University of Wisconsin-La Crosse) - O'Shea, John (University of Michigan)

**Abstract format:** Oral

The end of the Middle Bronze Age (c. 1600-1400 BC) is marked by the dissolution of tell-centered societies across the eastern Carpathian Basin. The reasons for this pan-regional collapse are poorly understood yet it provides the backdrop for the diverse social transformations that appear subsequently in the Late Bronze Age. To better understand the character of this collapse we examine the breakdown of the tell societies through the lens of the Maros (Mureș/Moriš) Culture. Drawing on archaeological data from a series of well-studied settlements and cemeteries we highlight the timing and tempo of changes in demography, economy, and organization during this period of decline and eventual collapse. Based on an expanded and more precise radiocarbon chronology, we show that the breakdown of the regional system does not occur as a single event, but rather propagates across the region starting with the collapse and dispersal of population from the center at Pecica Șanțul Mare, and gradually spreads west along the river system. Secondary centers in the Tisza-Maros Angle persist after Pecica's collapse and may even briefly intensify productive activities before they too are abandoned. It is argued that this pattern of sequential breakdown reflects the underlying segmental organization of the regional system, and suggests that the broader MBA collapse is most likely reflecting structural issues within and between the regional Carpathian societies rather than external factors such as invasion or migration.

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## PRESENT IN SETTLEMENTS, MISSING FROM CEMETERIES: WHERE DO BELEGIŠ FOLKS GO WHEN THEY DIE?

**Abstract author(s):** Kalafatic, Hrvoje - Šiljeg, Bartul (Institute of Archaeology) - Hršak, Tomislav (Archaeological Museum Osijek) - Mihaljević, Marija (Municipal museum Nova Gradiška)

**Abstract format:** Oral

In past decade extensive archaeological excavations were conducted on several Late Bronze age sites in the eastern part of Croatia. On basis of results of these excavations it is possible to speculate on settlement patterns, customs and rites characteristic for Late Bronze age populations of that region. Stratigraphy of the settlements can be divided in two main phases. The first characterized by the elements of the Late Tumulus Culture and Urnfield Culture and the second characterized by elements of Belegiš II culture. Cemeteries connected with these settlements show different picture. It is important to note that not a single element of Belegiš II Culture pottery was found in furnishings of excavated graves, what is not in accordance with finds in the settlement features. Same pattern is established on majority/all Late Bronze Age settlements excavated in that area. This situation raises many questions about nature of presence of Belegiš II Culture pottery style and consequently about presence of Belegiš II population in this region. This paper will address these questions and propose possible answers to them.



8 THE BALEY NECROPOLIS AND THE LOWER DANUBE BASIN IN THE 15TH – 11TH C. BC, ACCORDING TO THE RADIOCARBON DATES

**Abstract author(s):** Hristova, Tanya - Ivanov, Georgi - Alexandrov, Stefan (National Archaeological Institute with Museum - Bulgarian Academy of Sciences)

**Abstract format:** Oral

The Baley necropolis is part of the Encrusted Pottery Culture, attested along the Danube, in the Southern Carpathian Basin. At Baley are represented finds from sealed burial contexts (cremation in urns) from three chronological periods – Verbicioara 3, BrC-HaA1, and HaA2, well known in the Lower Danube Basin. In this region, cremation has EBA precursors, and is carried on through the Veribicioara 3 (BrB2/C, 15th-14th c. BC) period. The next stage, according to certain dating systems, belongs to the final 14th to the 12th c. BC. The last stage corresponds approximately to the 1200 – 1000 BC. The AMS radiocarbon dates from the region began to accumulate only recently. From the Baley necropolis there are 13 AMS radiocarbon dates from animal bones, from the later two stages of the necropolis: 15th–13th, and 14th-11th c. BC.

In these graves there are more than 90 intact or fragmented pottery vessels and finds, diagnostic of the culture. These represent a very sizeable sample of characteristic 15th – 11th c. Lower Danubian forms and decorations. The well dated ceramics assemblages, coupled with evidence of the burial ritual and the anthropological makeup of the population to which the necropolis belonged; the common traits and the transformations – in the pottery as well as in the ritual, are among the primary means for outlining, with a considerable degree of certainty, the picture of the time of the second half of the 2nd Millennium BC in the Lower Danube.

9 BRONZE AGE MEGA-FORTS OF THE SOUTH-EASTERN CARPATHIAN BASIN IN THEIR SOCIAL LANDSCAPE CONTEXT: ONE RING TO RULE THEM ALL?

**Abstract author(s):** Molloy, Barry (University College Dublin) - Jovanovic, Dragan (City Museum Vrsac) - Bruyere, Caroline (University College Dublin) - Birclin, Miroslav (National Museum at Pancevo) - Estanqueiro, Marta (University College Dublin) - Milasinovic, Lidija (National Museum at Kikinda) - Salamon, Aleksandar (National Museum at Zrenjanin)

**Abstract format:** Oral

Until recently, knowledge of settlement design and pattern in the south-eastern Carpathian Basin during the Late Bronze Age has primarily arisen from microregional studies. The excavation of several large enclosed sites, coined mega-forts, in the last decade has begun to provide better information on aspects of social organization. However, limited progress has been made on understanding the ties that link these individual sites in their landscape and societal contexts.

Radiocarbon dating programs at some of these sites indicate that we can speak of a horizon of mega-forts which emerged in the late 15th century BC, after the abandonment of tells, and continued to be occupied into the 13th century BC. The chronology and character of their abandonment remains unclear. With more than 10 now known, the rise of these forts is associated with the development of smaller but related settlement forms and the spread of channel-decorated pottery throughout the region. Though diversity of settlement and pottery style remains, it is argued that similarities increased in the south-eastern Carpathian basin at this time.

Using Google Earth survey and ground-truthing for prospection, we have identified new sites in a network now totalling more than 40 settlements. These are set back from major rivers that would have facilitated inward and outward diffusion of ideas and materials. We argue for intentional design in the construction of sites, indicative of premeditated and coordinated planning. It is particularly noteworthy that many factors indicate that competition was probably subordinated to cooperation at an intra-site level. Commanding riverine communication networks and sharing common purpose, we believe these sites constituted a significant socio-political block or blocks. All this, we argue, is evidence for complex social relationships that extend beyond specific settlements and represent a collective regional social organization that exercised control at a landscape rather than settlement level.

10 SÂNTANA-CETATEA VECHE AND THE COLLAPSE OF THE LATE BRONZE AGE SOCIETY IN THE LOWER MUREŞ BASIN

**Abstract author(s):** Sava, Victor (Museum of Arad) - Gogâltan, Florin (Institute of Archaeology Cluj-Napoca) - Krause, Rüdiger (Goethe Universität Frankfurt am Main)

**Abstract format:** Oral

About 100 years after the disappearance of the Middle Bronze tells, sometime around 1450 BC, one notes the beginning of a flourishing period in the Lower Mureş Basin. The number of settlements increased significantly at that time, just like that of the bronze and gold hoards. The commercial connections of the area reached distant regions, as attested by a series of prestige goods such as glass, faience and amber beads, pottery burnished with graphite and primary materials, mainly copper. In this context, between 1500 and 1400 BC, some settlements started to build fortifications and such elements ended up surrounding hundreds and even thousands of hectares.

In the Late Bronze Age landscape of the region, the fortification in Sântana stands out through the high number of metal items, through the dimensions and complexity of the system of fortification and their good state of preservation. At the same time, magnetometric measurements have led to the identification of 29 buildings, some of which have already been confirmed by recent archaeological excavations. Among these constructions one notes a building measuring ca. 1700 m2. The investigation of the fortification systems has proven the existence of violence conflicts that have led to the destruction of the entire site sometime in the

end of the 14th century BC, possibly the first half of the 13th century BC.

Most of the non-fortified settlements were also abandoned at the time when the fortification in Sântana was put to fire, during the 13th century BC. The number of settlements and bronze hoards decreased dramatically and one can speak of an actual collapse of the entire region. New power centers emerged in Transylvania and North-East Hungary. These major changes coincide with the spread of black/red pottery decorated with channels, known as Gáva pottery.

11 FROM TELLS TO FORTIFIED ‘MEGASITES’: THE MBA-LBA TRANSITION ALONG THE LOWER MAROS AND THE BERETTYÓ RIVERS

**Abstract author(s):** Szeverenyi, Vajk (Déri Múzeum, Debrecen; Institute of Archaeology, Research Centre for the Humanities, Budapest; Institute of Archaeological Sciences, Eötvös Loránd University, Budapest) - Priskin, Anna (Déri Múzeum, Debrecen; Universitat Autònoma de Barcelona) - Czukor, Péter (Móra Ferenc Múzeum, Szeged)

**Abstract format:** Oral

The transition from the Middle to the Late Bronze Age in the eastern part of the Great Pannonian Plain is a crucial and interesting episode of the prehistory of the Carpathian Basin. While the tell settlements of the Middle Bronze Age along the Berettyó and Maros/Mures rivers have been well-known for more than a century now, the settlement network of fortified ‘megasites’ of the Late Bronze Age has been revealed only during the past decade. In this paper, we will compare two regions – the valleys of the Berettyó and Lower Maros rivers – with regard to the observable changes of settlement types and settlement patterns between the end of the Middle Bronze Age ca. 1450 BC and the end of the Late Bronze Age ca. 800 BC. We investigate how they relate to various environmental factors such as hydrology, morphology and soil types. Through the comparison, we will attempt a reconstruction of some of the socio-economic changes through time and reveal the similarities and differences between these two crucial regions of Bronze Age occupation in the Carpathian Basin.

235 SPATIAL AND ENVIRONMENTAL CONTEXTS OF BARROW LANDSCAPES. THEORIES AND METHODS OF BARROWS INVESTIGATION IN MODERN ARCHAEOLOGY

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Szubski, Michal (Cardinal Stefan Wyszyński University in Warsaw, Institute of Archaeology) - Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT) - Rodríguez-Del Cueto, Fernando (Area of Prehistory; History Department. University of Oviedo)

**Format:** Regular session

Burial mounds are one of the most important manifestations of human ritual activity from the Neolithic to the early Middle Ages, sometimes even beyond. With the development of remote sensing techniques for detecting archaeological features, there has been a deluge of newly discovered sites in many parts of the world. For example, LiDAR has raised the detection of historic and pre-historic structures to an unparalleled renaissance: renowned examples of this technology are the recent discoveries of new areas in the Maya cities.

Also, the number of archaeological questions has been raised in the last years, such as the spread of the phenomenon, its chronology or how to choose appropriate research methods. Over the past two decades, research into barrows has focused not only on the mound itself but also on its context and surroundings. More and more often research relates to the whole landscape created by burial mounds: what is their spatial organization, in what environment do they occur, how the landscape could look before the destructive activity of modern ploughing and urbanization?

The session, which is a continuation of previous meetings in Barcelona ‘18 and Bern ‘19, aims to discuss research problems, case studies and methods currently used in the study of barrow landscapes in different chronological time frames around the world.

This year we would like to focus on the following subjects:

- Theories – for spatial and environmental context of barrows in archaeological and modern landscapes; sepulchral activities and importance of burial mounds in prehistory; specifics of barrows nearest surroundings.
- Methods – for remote sensing, data acquisition and excavating of anthropogenic mounds; spatial methods of barrow landscape analysis in micro- and macro scale (e.g. statistics, GIS, Bayesian approaches).
- Case studies – for regional and local barrows investigation.

ABSTRACTS

1 MEGALITHIC QUARRIES AND LOADING MODELS IN THE MEGALITHS OF SALAS COUNCIL (NW IBERIA): A COMPUTATIONAL APPROACH

**Abstract author(s):** Rodríguez del Cueto, Fernando (Universidad de Oviedo, Facultad de Filosofía y Letras, Departamento de Historia) - Pazos, Miguel (GEPN-AAT. University of Santiago de Compostela)

**Abstract format:** Oral

Traditionally, the Northwest of the Iberian Peninsula has been considered as a privileged area of the megalithic phenomenon in Spain,



mainly for the high number of mounds and megaliths that are still preserved -more than 5,000 in the whole region-, chronologically framed between the Neolithic and the Bronze Age (ca. 4300-2500 BC). In the lands of Salas (Asturias), and thanks to the ongoing Cobertoria project, funded by Fundación Valdés-Salas, new research is being carried out aiming to get new archaeological data, revising the old catalogues of sites with remote sensing techniques and excavating the main dolmen of A Cobertoria.

In this framework, the study of the relation between megaliths and their possible quarries is, however, a rather unexplored aspect of the megalithism in the NW of Spain. Using LiDAR techniques, we have identified possible quarries related to six different prehistoric cemeteries in their surroundings, later studied during fieldwork campaigns. Therefore, using the data gathered from Cobertoria project, jointly with GIS analysis, we have built some theoretical models of movement through the landscape aiming to identify and analyse the possible spatial relation of megaliths and the zones where they took the raw materials. For instance, an enormous amount of clay was used in the phase two of the Dolmen of Cobertoria (ca. 3700 BC). This megalith was built around 800 meters over the sea level, while the two possible points for the clay move around 600 meters. Based on that, important efforts were surely developed for building the tombs.

The results allow us to propose that some of these outcrops and quarries for gathering the clay are in clear connection with the prehistoric cemeteries, as a part of the new social landscapes created by the prehistoric communities.

2 **BARROWS AND MOUNDS AS A INTANGIBLE CULTURAL HERITAGE – SOME REMARKS FROM BIAŁOWIEŻA FOREST REGION**

**Abstract author(s):** Wawrzeńniuk, Joanna (Institute of Archaeology, Cardinal Stefan Wyszyński University in Warsaw)

**Abstract format:** Oral

The construction of mound is usually the result of a conscious human action that requires some idea, proper thought and arrangements. In the cultural landscape, the mounds could create various forms and sizes, and include: remains of ancient strongholds, castles, watchtowers, border points or burial places.

The symbolism of burial mounds, both with and without burial, is still ambiguous, although local toponymy provides some explanation. Some information are provided in the ethnographic datas and preserved in the memory. One can consider of the valorisation of this place as: a sacred mountain, a sacred place, a house for the dead, a place of mediation, a symbolic obstacle separating the deceased from the living, a symbolic pile, a manifesto of power or a kenotafium. It could be used for different funeral rites. This understanding of barrows or mounds will be presented on the example of object from the Białowieża Forest region from different periods.

3 **TOWARD BRINGING BACK BARROW LANDSCAPE. PREDICTIVE MODELS OF MOUNDS AND SPACE CONCEPTION OF THE BIELSKA PLAIN, NORTH-EAST POLAND**

**Abstract author(s):** Szubski, Michał (Cardinal Stefan Wyszyński University in Warsaw)

**Abstract format:** Oral

The Bielska Plain is major region, located in north-east Poland, which can be perfect example of modern, anthropogenic impact on prehistoric landscapes. Location of the oldest forests in Europe, the Białowieża Primeval Forest, the UNESCO heritage site, allow one compare how archaeological landscape preserves in highly protected area and how it was destroyed at rest of the region. During last years, using LiDAR technology, we detected all anthropogenic features in the region. Including over 2000 mounds with anthropogenic relief from different chronological periods – among them barrows, tar kilns, charcoal kilns and more. After remote sensing of the region, next step was to prepare several DTM derivatives to try to understand environment and geospatial regularity for mound features. Also several spatial analysis were conducted for clusters. Finally predictive models based on regression inference were used to recreate most probably areas for features placement. All of that allow to investigate this unique, “binary” landscape in entirety shape.

4 **A STUDY OF BURIAL MOUNDS IN RUSSIA USING LIDAR BASED ON DRONE-MOUNTED LASER SCANNER FOR DATA ACQUISITION AND VERIFICATION**

**Abstract author(s):** Novikov, Vasily (Institute of Ethnology and Anthropology - IEA; Energotransproekt) - Kainov, Sergey (State Historical Museum) - Vladimirov, Alexey (Kuban State Technological University) - Dorodnits, Svetlana (Energotransproekt) - Vlasov, Dmitry (Energotransproekt; MSU)

**Abstract format:** Oral

A massive LiDAR survey, covering an area of 1442.15 hectares, was carried out in Russia in 2018-19. This project included different archaeological sites with fortresses, settlements and barrows, spanning a time period from the Bronze Age to the Medieval period. The ALS data was collected with a drone-mounted Laser Scanner.

At all of the sites surveyed there were either groups of barrows or single barrows, ranging from 0.2 – 7 m in height, and 2 – 56 m in diameter. The survey covered 4 sites (a total of 411.85 hectares) in the central European part of Russia (the forest zone) and detected more than 2090 mounds (9th - 11th centuries). The survey also covered an area of 987 hectares in the south-European part (the steppe zone) and discovered 20 burial mounds (Bronze Age). One of the purposes of this study was to identify the different impact of anthropogenic activities and natural elements. Traces both effected the adjustment of the ALS equipment during the survey.

The data gathered by ALS was verified during reconnaissances. Furthermore, geophysical methods were used to study several of

the burial mounds, after which the mounds were excavated. Finally, the data allowed an assessment to be made of the method’s strengths, weaknesses and suitability for use in each of the regions and diverse conditions. It was concluded that drone-mounted laser scanning is very effective in Russia’s steppe and forest zones. A large amount of data can be collected within a short period of time (70-100 hectares in 24 minutes), and a sufficient number of ground points (20-50 points per m2) can also be collected to be used for the generation of DTMs. Overall, this method can help reconstruct the original landscape with barrows and understand the logic underlying the organization of cemeteries in different time periods.

5 **SPATIAL STRUCTURE OF THE MEDIEVAL BURIAL SITE WITH DESTROYED BARROWS: INVESTIGATIONS IN SHEKSHOVO, NORTH-EASTERN RUS’**

**Abstract author(s):** Krasnikova, Anna (State Historical Museum) - Makarov, Nikolay - Erokhin, Sergey - Ugulava, Nani - Milovanov, Sergey (Institute of Archaeology, Russian Academy of Sciences) - Troshko, Ksenia (Institute of Geography, Russian Academy of Sciences) - Zaytseva, Irina (Institute of Archaeology, Russian Academy of Sciences) - Modin, Igor - Pelevin, Andrey (Moscow State University)

**Abstract format:** Oral

Shekshovo 9 is one of the largest Viking Age burial sites in the Suzdal’ region, which was the core area of medieval North-Eastern Rus’. 244 barrows with cremation and inhumation burials with the grave goods of the 10th-12th cc. were excavated at the site in 1852. The burial site was rediscovered in 2011 after long-term surveys, as the landscape had strongly changed since the time of the first excavations. The area has now been completely levelled by ploughing and there are no traces of grave mounds on the cultivated land. Search for the site boundaries and the structure of the cemetery in this case needs the use of remote sensing and geophysical prospections in addition to archaeological methods.

Excavations conducted in 2011-2019 at the area of more than 2800 sq. m, revealed the remains of 16 levelled barrows with both destroyed and intact cremations and inhumations, remains of ground cremations, dispersed in the ploughed topsoil, and series of flat inhumations in the ground pits.

Artefact collection from the burial site consists of about 2700 items, more than a half of them was found in the topsoil. It includes metal ornaments and details of the costume, items of weapons, barrel-shaped weights, western European coins, dirhams, glass beads. Significant number of the artefacts is fragmented and often melted or partly burnt. Analysis of the spatial distribution of artefacts reveals the earliest areas of the necropolis and in some cases sheds light on the funeral rite in the destroyed complexes.

Integration of remote sensing data, geophysical maps, analysis of the spatial distribution of artefacts, and archaeological research data creates the basis not only for the identification of general boundaries of the burial ground, but also for detecting its individual structural elements, primarily barrows.

The work was supported by Russian Scientific Foundation grant №19-18-00538.

6 **CORRELATION BETWEEN LOCAL GROUPS OF BURIAL MOUNDS IN BESSARABIA**

**Abstract author(s):** Topal, Denis (National Agency for Archaeology of Moldova)

**Abstract format:** Oral

According to recent estimates, at least 10,700 barrows are located on the territory of the Dniester-Prut interfluvium, while there are 6,290 burial mounds in the right-bank regions of Moldova. On average, 2.5 mounds per 100 km2 are located between the Dniester and the Prut rivers. Preliminary data on the moundscape show the exceptional unevenness of their distribution, both chronological and spatial. Geographically, the burial mounds are also unevenly distributed. Based on their concentration, it could be outlined the contours of local groups, among which stand out: the Middle Prut, the Dniester-Răut (both are in the territory of Moldova), the Lower Dniester region, the Lower Prut-Lower Danube (partly in Moldova, partly in Ukraine) and the Black Sea group, located exclusively in Ukraine. In this study is presented an attempt to trace the connections between local groups based on the variability of the number of burials of various cultural and chronological massifs.

7 **CHANGE OF SPATIAL DISTRIBUTION PATTERN OF AMSA-DONG SITE BASED ON THE TOPOGRAPHIC CHANGES OF THE NEOLITHIC AND THREE KINGDOMS PERIOD**

**Abstract author(s):** Yoo, Sun Woong (Hanyang University Museum)

**Abstract format:** Oral

This study focused on the fact that the patterns of spatial distribution of the Neolithic and the Three Kingdoms period in Amsa-dong site is different. Although the time difference between the two periods is about 3,000 years, there are no archaeological materials between them, so it was also analyzed with regard to the context of changing patterns of spatial distribution of the site. The two aspects can be presumed that the influence of the natural environment prevailed rather than anthropogenic intervention due to the characteristics of the times.

Interpretations through topographic changes and archaeological aspects can help to understand the past as well as Amsa-dong site. For example, the study of the Neolithic Period on the Korean Peninsula tends to examine several sites together. This is important in the context of the times, but more intimate understanding of individual site is needed for a more detailed discussion. It may also serve as a reference for future site investigations. Estimates of topographic change patterns suggest that after the Neolithic

period, archaeological sites could be located further inland. In addition, it may be possible to explore additional sites through the palaeogeomorphic analysis data. Conclusively, the significance of this study is to clarify concretely through the quantitative and empirical review that goes beyond the threadbare and abstract common sense research that the Amsa-dong site was affected by the natural environment.

a. **FROM ONE-TO-MANY: DECODING SPATIAL DISTRIBUTION OF BURIAL MOUNDS IN NE ROMANIA**

**Abstract author(s):** Brasoveanu, Casandra - Asăndulesei, Andrei (Interdisciplinary Research Institute - Science Department, Arheoinvest Research Centre, “Alexandru Ioan Cuza” University of Iași) - Pîrnău, Radu (Romanian Academy, Iași Branch, Geography Group) - Brunchi, Radu (University “Alexandru Ioan Cuza” of Iași)

**Abstract format:** Poster

The north-eastern part of Romania contains a huge number of burial mounds most of them unexplored and less understood. Previous, usually targeted, research confirms this funerary practice starting with prehistory and to the Middle Ages. So far, no efforts have been made in order to systematically record these monuments and to establish the chronology. On the other hand, many are threatened by natural or human-induced risk factors being irreversible destroyed. One of the main hazards is represented by agricultural works and, in some other large areas, by intensive grazing.

Recently, a new methodological approach based on high-resolution non-destructive ground-based geophysical and airborne sensing techniques (vertical gradient magnetometry, oblique aerial photography, photogrammetry and LiDAR) has been applied for Bahluiet River catchment in order to better pinpoint the location and to characterise the micro-morphology of the tumuli. A quick view of the dedicated literature and archaeological repertoires for the aforementioned region documented only 25 of different kinds of tumuli located relatively precise.

Using high-resolution digital elevation models, derived from LiDAR measurements, we were able to highly increase the number of this type of sites (around 200 sites) and to reconsider the spatial distribution into the landscape (most of them are located on the upper part of the catchment or arranged in large clusters on slight slopes). Usually, we can distinguish one or two mounds greater and better preserved than the ones surrounding them that are in most cases, flattened.

Although this endeavour proves to be a difficult one, based on some morphological characteristics and considering data from geophysical prospections relative to the empty spaces between the mounds, in some cases, we tried to differentiate and assign them to a chronological period.

**241 OUT OF DATE? CURRENT ADVANCES IN RADIOCARBON DATING**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Demján, Peter (Institute of Archaeology of the CAS, Prague) - Gaydarska, Bissarka (Independent Researcher) - Dreslerová, Dagmar - Vondrovský, Václav (Institute of Archaeology of the CAS, Prague)

**Format:** Regular session

In recent years, issues of radiocarbon dating have been somewhat overshadowed by the bio-molecular revolution, in particular the contributions of aDNA and stable isotopes. Nevertheless, we believe that radiocarbon dating still plays a significant role in the network of scientific methods currently changing the entire discipline of archaeology. Improvements in radiocarbon chronologies occurring in the last two decades, especially Bayesian probability modelling, the growing pool of datable materials and new theoretical approaches, are widening our interpretational possibilities for understanding the past. Answering the fundamental question 'When?' with ever-increasing accuracy and precision enables us to produce chronologies on the scale of people's lifetimes. Growing numbers of available radiocarbon data allow us to explore entirely new perspectives at multiple levels. We can construct new narratives of long-term processes as well as identify short events and tipping points, creating a more flexible, interactive image of the past.

In this session, we aim to discuss all aspects, challenges and also potential and real pitfalls of radiocarbon dating. We welcome contributions addressing:

- New achievements in radiocarbon dating regarding materials, precision and techniques
- Chronological modelling
- The relationship between relative and absolute chronology
- Ways in which new chronologies have influenced our interpretative inferences
- Limitations of the radiocarbon method

A range of contexts and spatial units could be addressed, from individual sites to regions or periods.

**ABSTRACTS**

**1 CHRONOLOGICAL MODELLING OF THE DISPERSAL OF BROOMCORN MILLET CULTIVATION IN BRONZE AGE EUROPE**

**Abstract author(s):** Meadows, John (Centre for Baltic and Scandinavian Archaeology - ZBSA; Christian-Albrechts-University Kiel, Leibniz Laboratory for AMS Dating and Stable Isotope Research) - Filipović, Dragana - Kirleis, Wiebke (Institute for Pre- and Prohistory, Kiel University)

**Abstract format:** Oral

Broomcorn millet (*Panicum miliaceum*) is native to East Asia, but has been widely reported in European archaeobotanical assemblages from the Neolithic onwards. Direct AMS <sup>14</sup>C dating of some of these apparently early specimens showed them to be intrusive, however, and instead suggested that millet cultivation only reached Europe during the Bronze Age (Motuzaite-Matuzeviciute et al. 2013). Now, thanks to a systematic programme of direct dating by CRC 1266, Kiel University, Germany (DFG grant 2901391021), in collaboration with archaeobotanists from 13 countries, we have c.130 pre-Roman AMS dates on single charred grains, or fused clusters of grains of broomcorn millet, from over 60 sites. Using these results, we have developed a simple spatial-temporal model, by dividing central and south-eastern Europe into smaller regions, and using Bayesian chronological modelling to estimate when millet cultivation arrived in each region (Filipović et al. in prep.). The results appear to show steady dispersal across central and southern Europe between c.1550 and 1350 cal BC, then a 100-200 year delay before millet spread rapidly across the north German lowlands around 1200 cal BC. This presentation will focus on the robustness of these patterns, and on necessary compromises in the modelling process between spatial and temporal precision, which are issues that should be addressed whenever diffusion processes are mapped.

Motuzaite-Matuzeviciute G, Staff RA, Hunt HV, Liu X, Jones MK. 2013. The early chronology of broomcorn millet (*Panicum miliaceum*) in Europe. *Antiquity* 87(338):1073-85.

**2 CHRONOLOGICAL MODELLING: A NON-BAYESIAN ALGORITHMIC APPROACH**

**Abstract author(s):** Levy, Eytan (Tel Aviv University)

**Abstract format:** Oral

The advent of Bayesian modelling in radiocarbon studies allowed archaeologists to include a wide set of chronological constraints into their radiocarbon models. Such modelling enabled the obtention of tighter chronological confidence intervals and allowed to automatically check whether the radiocarbon samples are in agreement with the prior Bayesian constraints. We propose an alternative approach, not limited to radiocarbon, where the archaeologist uses software to build complex chronological models featuring termini post & ante quem, duration bounds and several kinds of synchronisms between chronological entities. In this model, chronological ranges obtained through radiocarbon are treated as any other date-ranges, namely as the combination of a terminus post quem and a terminus ante quem, though in a deterministic fashion, without an associated probability. The set of encoded constraints is then automatically checked by a fast algorithm in order to ensure its consistency. If the model is found consistent, an algorithm computes the narrowest possible ranges for the dates and durations of all chronological entities. These use cases will be demonstrated using a new software called ChronoLog. The advantage of our approach lies in the high speed of the deterministic algorithms involved, which enable the users to interactively query models with hundreds of constraints and obtain instantaneous results. Its downside is that no probability is associated to either the input constraints or the output ranges: the latter are guaranteed to be optimal (i.e. as narrow as possible) provided the input constraints are correct. We will discuss the pros and cons of our approach with regard to radiocarbon dating and compare it to the more classical Bayesian approach to chronological modelling.

**3 ARTEFACTS IN TIME: ARCHAEOLOGICAL STRUCTURES IDENTIFIED BY DENSE RADIOCARBON SAMPLING.**

**Abstract author(s):** Demján, Peter (Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague)

**Abstract format:** Oral

Calibrated radiocarbon determinations are routinely used to gain absolute chronological information about archaeological artefacts, ranging from single finds to larger contexts such as settlement features or whole phases of occupation. This is done by associating the calibrated date with a specific event (such as felling of a tree) which led to the construction of the artefact (e.g. the post of a house). There are however find situations, where even though we are able to determine that some human activity took place based on an accumulation of its associated residues (e.g. pottery fragments, charcoals, cultivated plant seeds), we lack more complex structures (e.g. houses, pits, strata) that would indicate whether it's the result of a single event, multiple separate events or a continuous habitation.

Thanks to increasing availability of high precision radiocarbon dating, we are now able to view the whole series of dates from a single site or context as a probability distribution and use statistical methods to reveal significant irregularities in it, which can be interpreted as artefacts of human activity. In this presentation we will examine the thesis that by performing cluster analysis of a set of radiocarbon dates based on their distance in time, we can determine the minimal amount of separate events that would explain their distribution. We will also look at ways to eliminate the possibility that the observed gaps between the events are a product of irreg-

ular sampling or the calibration process. Events identified in this way can then be treated as evidence of archaeological structures such as settlement phases and used for Bayesian modeling to further precise our interpretation of the find situation.

The work was supported by the ESF project "RAMSES" (No. CZ.02.1.01/0.0/0.0/16\_019/0000728).

4 TWO RONDELS, ONE SITE AND MANY PROBLEMS OF CHRONOLOGY: A CASE STUDY FROM THE POST-LBK SITE OF PRAHA-KRČ (CZ)

**Abstract author(s):** Vondrovský, Václav (Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague)  
**Abstract format:** Oral

Rondel enclosures represent an emblematic feature of the Neolithic period in Central Europe. As they are formed just by simple circular ditches and occasionally by remnants of palisade, they do not give much hints to reconstruct and understand the agency taken within the rondel's walls. The most agreed interpretations consider rondels as astronomic observatories, meeting places for feasting and commodity interchanging, or arenas for various rituals. Recently, it is known about 150 sites with rondel enclosures within Central Europe. Remarkably, some of them gave evidence of two or even more enclosures built on a single site. The paper follows specific question related to these sites: Were multiple rondels contemporaneous or were they used subsequently? To answer, we employ Bayesian modelling of radiocarbon data in combination with stratified sampling of animal bones from ditches of two rondels excavated in Praha-Krč, Czech Republic. Except for resulting chronological model, hidden or more obvious pitfalls or radiocarbon modelling are also presented. There is a considerable uncertainty connected with taphonomy of ditch infill and reliability of excavated bones, which might skew the model. Despite that, the chronological model opens new ways for understanding the rondel monuments and their significance within settlement network of Neolithic communities. The paper was supported by the ESF project "RAMSES" (No. CZ.02.1.01/0.0/0.0/16\_019/0000728).

5 SPATIOTEMPORAL INTERPOLATION BASED ON BULK RADIOCARBON DATA: TWO CASE STUDIES FROM ARCHAEOLOGY AND ARCHAEOGENETICS

**Abstract author(s):** Schmid, Clemens - Schiffels, Stephan (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena)  
**Abstract format:** Oral

The amount of available radiocarbon dates from archaeological contexts is enormous and openly accessible data collections like EUROEVOL [1], AustArch [2] or KITEEastAfrica [3] (just to name a few) are a future gold mine for meta-studies. One interpretation of this data is especially useful for the reconstruction of long-term and large-scale processes in prehistory: Radiocarbon dates can be seen as independent "measurements" in conjunction with dependent variables. The dependent variable can include any kind of cultural or natural data relevant for a specific research question. Modelling it in relation to the independent radiocarbon sample position in space and time is, therefore, a promising meta-analysis method with a huge spectrum of applications. We present two independent case studies where we apply Gaussian Process Regression on contextualized radiocarbon samples to interpolate the distribution of Bronze Age burial rites and human genetic ancestry components.

Case study 1: European Bronze Age archaeology traditionally focuses on two major dimensions to categorize burials — although there is an immense variability of attendant phenomena: Flat graves versus burial mounds and cremation versus inhumation. The radiocarbon database RADON-B [4] contains dates on graves attributed to these major categories. We reconstruct their diachronic development in Central- and Northwestern Europe and distinguish cultural units with homogeneous history.

Case study 2: A recently compiled global archaeogenetic dataset [5] combines published genotype information for ancient and present-day individuals with context information about the position in space and time for each sample — the latter most often derived from radiocarbon dates. The reported 597,573 genome-wide ancestry-informative markers are sufficient to quantify the genetic relationships between all individuals using multivariate statistics such as Principal Component Analysis. We use these methods to derive basic ancestry components for European prehistory, interpolate their spatiotemporal distribution and explore patterns of large-scale change.

6 DEATH METALS II AND RADIOCARBON DATING

**Abstract author(s):** Daróczy, Tibor (Romanian Academy, Institute of Archaeology and Art History)  
**Abstract format:** Oral

Establishing a chronological frame for any region, period or set of archaeological finds is imperative for the discussion of their agencies, directionalities and wider networking. Cherry picking single sites or contexts or finds has been a long established means of sampling, understandable, as funding is usually limited, as is access to finds. Nevertheless, the result of half of century of sampling in the Bronze Age Eastern Carpathian Basin is, that to lesser extent issues of chronology have been addressed, while questions of how to employ absolute dates and sampling on a comprehensive scale were neglected. Death Metals II employs radiocarbon dating on Bronze Age funerary contexts with metals in order to discuss lifespans of certain types, highlight directionalities of circulation of ideas and metal objects within the region, but also to and from it. Funerary contexts provide a means by which both, ceramic and metal, relative chronologies might be correlated, and if the organic materials are dated by radiocarbon dates a solid BCE date frame can be established. A comprehensive sampling strategy is developed, and implemented, while both older dates and newly sampled

ones are employed. Lastly, such a systematic approach has the potential to shake previously held views on networking and directionalities of movement of metals, but also of their agencies, like warriorhood or womanhood, since metal objects are actively used in negotiating identity and social status.

7 CENTRAL EUROPEAN EARLY BRONZE AGE CHRONOLOGY REVISITED: A BAYESIAN EXAMINATION OF LARGE-SCALE RADIOCARBON DATING

**Abstract author(s):** Brunner, Mirco (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCCR; Christian-Albrechts Universität zu Kiel, Graduate School «Human Development in Landscapes») - von Felten, Jonas (University of Bern, Institute of Archaeological Sciences) - Hinz, Martin (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCCR) - Szidat, Sönke (University of Bern, Department of Chemistry and Biochemistry; Oeschger Centre for Climate Change Research - OCCR) - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCCR)

**Abstract format:** Oral

In archaeological research changes in material culture and the evolution of styles are taken as main indicators for socio-cultural transformation. They form the basis for typo-chronological classification and the establishment of phases and periods. Central European Bronze Age material culture reveals both quantitative and qualitative changes during the Bronze Age and represents a perfect case study for analysing phenomena of cultural change and adoption of innovation in societies of prehistoric Europe. Specifically, we focus on the large-scale change of material culture and the emergence of new burial rites in the second millennium BC: the shift from inhumation burials in flat graves to complex mounds and to simple cremation burials. The transition from the Late Neolithic (LN) to the Early Bronze Age (EBA) in Central Europe has long been considered as a linear evolutionary development that led to a growing mastery of the new technology. Paul Reinecke was the first to define the Central European EBA as Bz A1 and Bz A2 – which were seen as states of technical progress. Here, we adopt an innovative approach with the aim to quantify this phenomenon. Through regressive reciprocal averaging and the Bayesian analysis of radiocarbon-dated grave contexts located in Switzerland and Southern Germany, we modelled chronological changes in the material culture and the change of burial rites in these regions in a probabilistic way. For summarizing radiocarbon dates we use Kernel Density models with the aim to visualize cultural changes in the third and second millennium BC. Our study and the interpretation of radiocarbon data demonstrate a clear typological sequence of phases Bz A1, Bz A2 and BzB and disprove the postulated chronological overlap of phases. The linking of the archaeological relative-chronological system with absolute dates is of major importance to understand the temporal dimension of the EBA phases.

242 MEDIEVAL TOWNS OF EUROPE AND THEIR SACRED SPACES

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin  
**Organisers:** Cringaci Tiplic, Maria Emilia (Institute of Social Sciences and Humanities Sibiu, Romanian Academy) - Nagy, Balázs (Eötvös Loránd University, Budapest)  
**Format:** Regular session

Inside the medieval towns, the edges of the sacred space could be perceived in many ways, visual, auditory, olfactory, spiritually. The cathedral, churches, monasteries and their cemeteries are the most important elements of many towns that have their origins in the Middle Ages. Moreover, they are often the best preserved medieval structures and among the most commonly studied structures inside a town. Approaches of the townscape and the topography from the perspective of ecclesiastical buildings, cemeteries or other area reserved for religious ritual are encouraged.

This session wants to explore how the ecclesiastical buildings and other sacred spaces (like cemeteries) were distributed in the town and how the sacred space evolved, changed or even disappeared during time in order to gain a better overview on similarities and differences of medieval towns from across Europe.

Papers of the session will follow methodological problems, relations between different ecclesiastical buildings, ecclesiastical building evolution and adaptation, the topography of cemeteries and their transformation inside a town, medieval townscape, spatial analysis, etc.

ABSTRACTS

1 EXPLORING THE SACRED SPACES OF MEDIEVAL SIBIU: CHURCHES, MONASTERIES, CHAPELS AND CEMETERIES

**Abstract author(s):** Cringaci Tiplic, Maria Emilia - Nacu, Andrei (Institute of Social Sciences and Humanities Sibiu, Romanian Academy)  
**Abstract format:** Oral

In the Middle Ages, Sibiu had a preeminent position in the urban hierarchy of Transylvania and of South-Eastern Europe. The city was attested for the first time in 1191 as an ecclesiastical center of the Transylvanian Saxons and was home to numerous places of wor-



ship and sacred sites (churches, monasteries, chapels, cemeteries, hospitals). However, with the advent of the Reformation in the 16th century and the noticeable changes that occurred during the industrial age and the communist dictatorship (the 19th and 20th centuries), the medieval places of worship and devotion and their neighborhoods have been deeply transformed. Consequently, the previous scientific contributions regarding the identification of the first parish church and of several monasteries and chapels, including their belonging to certain monastic orders, reveal several failings that have caused recurrent debates. Even though numerous well-researched studies on the ecclesiastical edifices have been published, an overall analysis of their topography, including the layout of the cemeteries, was never undertaken before. Using state of the art GIS applications, we have processed the most important historical city maps in order to offer an overview of visibility of the past ecclesiastical forms and spaces (locations) and to recreate an authentic rendering of the ecclesiastical townscape of Sibiu in the later Middle Ages. Besides the cartographic sources, our work is also supported by archaeological, architectural, documentary and iconographic evidence.

This work is supported by a grant of Romanian Academy, ‘Patrimoniul’ Foundation, research project number GAR-UM-2019-II-2.5-3 / 15.10.2019.

## 2 THE CHURCH TOPOGRAPHY OF EARLY COPENHAGEN

**Abstract author(s):** Jark Jensen, Jane (Museum of Copenhagen)

**Abstract format:** Oral

In Copenhagen two medieval churchyards, both founded in the 11th century, existed side by side only 150 meters apart in the early town of Copenhagen. One of them was taken out of use after about 100 years and vanished from the townscape, whereas the other churchyard, St Clemens, existed until the Reformation in 1536. The two churchyards were both partly excavated between 2008-2019 and the results demonstrates different burial traditions. Was this a result of two different groups of inhabitants for whom origin and traditions stayed an important factor even though they became members of a common(?) urban community? Also, the St Clemens churchyard indicates signs of other uses than for burials. The organization of the burials at the churchyard might also indicate guidelines for moving about in the area.

This paper will discuss the role of the churchyards as physical and symbolic entities in the early shaping of the urban environment. This includes how the churchyards would have presented themselves to the surrounding urban community, and what the signs are of use of the sacred areas for other activities than the religious ceremonies. It will also be discussed, why only one of the churchyards survived, and what this can reveal of the early urban development of Copenhagen.

## 3 RELIGIOUS TOPOGRAPHY OF BRAȘOV IN THE MIDDLE AGES

**Abstract author(s):** Nacu, Andrei - Cioltei-Hopârtean, Corina (Institute of Social Sciences and Humanities Sibiu, Romanian Academy)

**Abstract format:** Oral

The topography of medieval settlements has been shaped by various architectural features, but the ecclesiastic ones may have had the greatest impact upon both their inhabitants and visitors. Imposing parish churches, chapels or abbeys are a structural element of the medieval European townscape. This is also the case of Brașov, a major urban center located in south-eastern Transylvania, in the central part of Romania.

The presentation will record all the medieval landmarks of the city and will reveal their history, the reasons behind their presence in certain neighborhoods and how the laymen and the authorities interacted with them. We strive to recreate the ecclesiastic topography of medieval Brașov using written and archaeological sources, on one hand, and cartographic documents, on the other. A prominent aspect will be the employment of GIS (Geographic Information System) software for the analysis of the oldest historical maps of the city, specifically three representations produced by the Habsburg military engineers at the end of the 17th century and in the first decades of the 18th century. The result of our research will be a digital reconstruction that will constitute a support tool for the scientific community and an incentive for the preservation and promotion of the medieval cultural heritage of Brașov.

This work is supported by a grant of Romanian Academy, „Patrimoniul” Foundation, research project number GAR-UM-2019-II-2.5-3 / 15.10.2019.

## 4 A ROYAL BRICK HOUSE NEAR THE EDGE OF TOWN: RELIGIOUS AND SOCIAL TOPOGRAPHY IN THE MEDIEVAL TOWN OF ROSKILDE, DENMARK

**Abstract author(s):** Langkilde, Jesper (ROMU, Roskilde Museum)

**Abstract format:** Oral

In 2019 the remains of a late medieval brick-build house and cellar was excavated in the town of Roskilde, Denmark. The find was surprising since the site is located near the town fortification and at a distance from the town center and the main streets were the medieval brick houses of the upper social classes are usually considered concentrated. A likely explanation was found in a medieval written source, which indicated that the brick-house had belonged to Queen Margret I, ruler of Denmark 1376-1412. The excavated building was found close to the site of a nunnery, which were probably the motivation for the queen to locate her residence at this specific site. The presentation will give an overview of the ecclesiastical topography of Roskilde, and thus point at the possible influence of religious institutions on elite residential patterns, in opposition to the mercantile, economic and infrastructural factors

normally focused on in our understanding of the development of medieval urban social topography.

## 5 ARCHAEOLOGICAL INVESTIGATION OF THE CEMETERY OF ST. JACOB’S CATHEDRAL: A NEW DATA ON INTERACTIONS OF DIFFERENT COMMUNITIES IN MEDIEVAL RIGA

**Abstract author(s):** Tomsons, Arturs (University of Latvia)

**Abstract format:** Oral

In 2018. extensive excavation work was done near St. Jacob`s Cathedral in Riga, Latvia. During the excavations, almost 300 burials were investigated as well as the largest ossuary in the Baltic countries discovered, containing skeletal remains of almost 4000 individuals. Analysis of acquired the skeletal remains and other samples provide us with new data about the life and health conditions of the Latvian inhabitants of Medieval Riga town, which were not available before, as only two other medieval cemeteries, belonging mainly to local German population near the Dome Church and St. Peter`s Church were investigated and analysed previously. New source material available now allows researchers not only localise more precisely the unknown borders of the cemetery of St. Jacob`s cathedral but also comparing differences between different cultural and ethnolinguistic communities living beside one to another during several centuries in one of the most significant towns in the medieval state of Livonia.

## 6 THE EXTRAORDINARY HISTORY OF THE DOMINICAN MONASTERY IN LECZYCA – FROM ECCLESIASTICAL BUILDING TO MODERN PENITENTIARY

**Abstract author(s):** Ginter, Artur (Institute of Archaeology, University of Lodz)

**Abstract format:** Oral

In the Middle Ages, Leczyca located in Central Poland was one of the most important urban centers in the country. Initially (in 10th century), there was a stronghold surrounded by numerous settlements. In the 11th century, a Benedictine abbey was founded. In the 12th century after the abbey was demolished, the Romanesque archi-collegiate church was erected and which exists up till today.

The thirteenth century brought the rise of the urban center, which was almost immediately settled by the Dominicans, who erected the church and the adjacent monastery.

In the fourteenth century, during the reign of Casimir the Great, Leczyca was surrounded by city walls, partially contiguous to the monastery buildings. In the same century the royal castle and city parish church were build.

In the modern ages Dominican monastery was several times burnt and rebuild, finally having absorbed both the gothic defensive walls and the corner tower.

In 1799, when Poland was under the Prussian occupation, the convent was dissolved and Prussians turned the abandoned buildings into a prison. The facility was so well prepared for penitentiary purposes that it served as a prison for extremely dangerous criminals until 2006.

Since then the prison has been abandoned and put up for sale. Due to the fact that there is no buyer, architectural and archaeological research began there, which annually uncovers secrets of the medieval order. Not only relics of the oldest church and monastery were found, but also the crypts located within it and the cemetery. Research will also continue in 2020.

## 7 ECCLESIASTIC MONUMENTS OF BRAȘOV/KRONSTADT/BRASSÓ AND THE (IMAGINED) TOPOGRAPHY OF A TRANSYLVANIAN TOWN IN LATE MEDIEVAL AND EARLY MODERN TIMES

**Abstract author(s):** Cîmpeanu, Liviu (Institute of Social Sciences and Humanities Sibiu, Romanian Academy)

**Abstract format:** Oral

By definition, a monument has extraordinary features that mark landscape and human minds alike. Without any doubt, the Medieval and Early Modern World of Europe was marked by ecclesiastic monuments, from great cathedrals and abbeys to simple chapels and altars at crossroads. A very interesting case study offers Brașov/Kronstadt/Brassó, in the south-eastern corner of Tansylvania, where historical sources attest several ecclesiastic monuments, in and around the city. Late medieval and early modern documents and chronicles reveal not only interesting data on the monasteries, churches and chapels of Brașov/Kronstadt/Brassó, but also on the way in which citizens and outsiders imagined those monuments in their mental topography of the city. The inhabitants of Brașov/Kronstadt/Brassó and foreign visitors saw the monasteries, churches and chapels of the city, kept them in mind and referred to them in their (written) accounts, when they wanted to locate certain facts or events. The present paper aims in offering an overview of the late medieval and early modern sources regarding the ecclesiastic monuments of Brașov/Kronstadt/Brassó, as well as an insight into the imagined topography of a Transylvanian town.

This work is supported by a grant of the Romanian Academy, „Patrimoniul” Foundation, research project number GAR-UM-2019-II-2.5-3 / 15.10.2019.

### a. NECROPOLISES OF MID 12-19C. IN THE STRUCTURE OF GOROCHOVETS’ TOWN AREA

**Abstract author(s):** Milovanov, Sergei (Institute of Archaeology, Russian Academy of Sciences)

**Abstract format:** Poster

Gorochovets was founded in the mid 12th century and originally was a small fortress on the eastern border of the Vladimir-Suzdal

	<p>princedom. In the early period of the Gorochovets’ history (mid 12 – 13c.) its necropolis appears as burial mounds. It was located 300m outside the town’s area on the cusp’s edge and was separated from the town by a system of deep ravines. The presence of the mounds and their location on the edge of the high bank signifies that the critical location of the necropolis was for symbolic reasons. Burial ground dominates over surrounding area and landscape, it marks domesticated area. However, at the same time it was placed outside inhabited area and separated from it by heavy-going natural barriers (deep ravines).</p> <p>In 1239 the town was devastated by the Mongol troops. Afterwards a standstill of urban life is noted. There are no significant remains of this period documented at the settlement, thus the suburban area was reduced. An explored necropolis in the lower part of the town is supposedly dated back to this period. It is adjoined close by the inhabited part of the town, but detached by a nameless creek forming a border between the living and the cemetery.</p> <p>A new prosperity period of the town began in the 16-17c. During this period, necropolises’ location was largely transformed. They were integrated into the town’s structure and situated in the midst of the inhabited area, not outside as it was in the past. Archaeologists investigated three cemeteries. Two of them were attached to parish churches. St. Trinity and Candlemas abbeys were founded in the mid 17c. Some benefactors and monks were buried within its premises. Thus, necropolises were firmly bounded to the urban area and its sacred areas became an undivided part of the town.</p>
b.	<p><b>THE TOPOGRAPHY OF MENDICANT ORDERS IN MEDIEVAL TRANSYLVANIAN TOWNS</b></p> <p><b>Abstract author(s):</b> Cioltei-Hopartean, Corina (Institute of Social Sciences and Humanities Sibiu)</p> <p><b>Abstract format:</b> Poster</p> <p>The 13th century has favored the emergence and rise of mendicant orders deep within medieval European society. This was the century of religious reformatory policies, and, at the same time, it was a period for developing urban communities. The latter, by opening its gates to mendicant cloisters, have diversified their topography. The Hungarian mendicant province was established by the end of the 1220s. During the 13th century, but mostly after the Mongol invasion, the Hungarian royalty made the urban development into a central policy, emphasized by the high number of royal favors granted to most of these. What turned them into recipients of royal attention was precisely their economic potential, which was also the main motivation for various mendicant orders in choosing to settle in one or the other of the realm’s towns. In Transylvania the first convents emerged during the first half of the 13th century.</p> <p>The present paper aims to reveal the changes brought upon the topography of medieval towns by the mendicant cloisters as depicted through written and archeological sources. Through a comparative analysis of the medieval Transylvanian urban settlements we will focus upon their particular place within or outside the fortified town walls and also their position in relation to other religious orders or monuments. Several towns became the home of more than one mendicant order, this being the case of Bistrița, Sibiu, Braşov or Cluj Napoca, while others „hosted” only one of them. While for some of these towns we are able to identify a standard in the medicant topography, others are portrayed rather by contrast, this being the case of Sibiu, one of Transylvania’s most representative medieval towns.</p> <p>This work is supported by a grant of Romanian Academy, „Patrimoniu” Foundation, research project number GAR-UM-2019-II-2.5-3 / 15.10.2019.</p>
245	<p><b>ESTABLISHING BOUNDARIES: LINEAR EARTHWORKS, FRONTIERS AND BORDERLANDS IN EARLY MEDIEVAL EUROPE</b></p> <p><b>Theme:</b> 2. From Limes to regions: the archaeology of borders, connections and roads</p> <p><b>Organisers:</b> Delaney, Liam (University of Chester) - Tummuscheit, Astrid (Archäologisches Landesamt Schleswig-Holstein) - Williams, Howard (University of Chester) - Witte, Frauke (Museum Soenderjylland)</p> <p><b>Format:</b> Regular session</p> <p>In stark contrast to the sustained investigation of the Roman Empire’s frontier zones, early medieval linear earthworks (including those called ‘ramparts’, ‘dykes’ and ‘walls’) have been repeatedly marginalized in archaeological research. Even within investigations of early medieval territorial creation and organization, and further still for those earthworks of a monumental scale, such as Offa’s Dyke, Wat’s Dyke, Wansdyke and the Danevirke, their date, function and significance remain poorly understood. Yet these earthworks may have operated as the spines of early medieval frontiers and borderlands and their creation had ideological, political, social and economic dimensions. Their creation led, in some instances, to the establishment of the complex networks of surveillance and control, land divisions and territory formation which set the groundwork for the transformation of medieval communities and kingdoms. Even today, early medieval linear earthworks are deployed in political and cultural debates and discourses on migrations, ethnicity, frontiers and nationhood.</p> <p>This MERC sponsored session aims to promote new research on early medieval frontier landscapes, including monumental linears, their landscape settings, afterlives and legacies, including their heritage management and interpretation. The session organisers invite contributions to address themes relating to linear earthworks and medieval frontiers and borderlands including: (i) their relation to post-Roman territorial regions; (ii) how they were components of frontier networks; (iii) the dating and biographies of these linear works; (iv) the role they played in the emergence and collapse of communities and kingdoms, (v) their role in interactions between different societies; (vi) what elements of broader ideological, political, cultural and economic geographies in the early medieval period they represent; (vi) their contemporary role in modern cultural identity; (vii) the impact of heritage conservation, management and</p>

	<p>interpretation on these features; (viii) how they are viewed in contemporary media and popular culture.</p>
	<p><b>ABSTRACTS</b></p>
1	<p><b>DYKES AS DEEDS – MEMORY AND MONUMENT-BUILDING IN EARLY MEDIEVAL EUROPE</b></p> <p><b>Abstract author(s):</b> Williams, Howard (University of Chester)</p> <p><b>Abstract format:</b> Oral</p> <p>Can we consider dykes as ‘deeds’: memorable and efficacious for their creation and placement more than their longevity of use? This paper presents a new framework for interpreting the mnemonics of dyke-building in early medieval Europe, focusing on the process of rampart construction, their appropriation of striking landmarks and ancient monuments, and strategies of place-naming. Together, this evidence contests dykes as exclusively royal projects whose ideological motives were focused on promoting the authority, prestige and fame their creators. Instead, I suggest that linear earthworks fostered and transformed social memories in other fashions. This approach is explored in relation to Offa’s Dyke, Wat’s Dyke and in relation to other smaller-scale linear earthworks in the Anglo-Welsh borderlands and elsewhere. As complex monuments built to transform landscapes and control movement through them, I present the case that linear monuments created a genealogical and legendary fame which transcended the martial, socio-political and territorial aspirations of individual rulers.</p>
2	<p><b>LINEAR EARTHWORKS IN SCANDINAVIA: AN OVERVIEW</b></p> <p><b>Abstract author(s):</b> Witte, Frauke (Museum of Southern Jutland)</p> <p><b>Abstract format:</b> Oral</p> <p>Before the linear barrier of the Danevirke was built at the foot of the Jutish peninsula, a large number of linear barriers functioned in Scandinavia. Most of them are earthworks and sea-barriers in Jutland, but in nowadays Sweden, a few earthen ramparts and stone walls and a number of sea barriers are known too. None are known in e.g. Norway, Finland and Iceland. The linear barriers in Jutland were built from the first and second centuries AD onwards. They typically consist of banks and palisades with ditches, and were mostly used as road blockers. The purpose of these early barriers are still mainly unresearched and only a few have been archeologically investigated, therefore details of their building history and precise dating are often unknown. The majority are only registered because they can still be seen by eye or through aerial photography. A few were discovered by coincidence under excavations.</p> <p>The purpose of the linear barriers in Denmark and Sweden can often be extracted from their geographical position: besides being territorial marks for different tribes and military fortification (sea-barriers), they were road barriers facing either south or north across the most important road through Jutland, the ancient military road (Hærvejen). Only a few might have been territorial boundaries. We assume that the tradition of building these linear barriers in southern Scandinavia finally lead to the Danevirke and might have been brought to England by the Angles when migrating.</p> <p>This paper will show the distribution and type of the Scandinavian barriers and try to discuss who their builders might have been.</p>
3	<p><b>MAKING A MEDIEVAL BORDERLINE: THE ARCHAEOLOGY OF TRADITIONAL MEETING PLACES ON THE ANGLO-SCOTTISH BORDER C. 1200-1500</b></p> <p><b>Abstract author(s):</b> Steingraber, Aubrey (University of York)</p> <p><b>Abstract format:</b> Oral</p> <p>For 800 years, the Anglo-Scottish border has been an influential division between England and Scotland. Although periods of conquest during the late medieval period shifted control of large territories in the region, the borderline established in the thirteenth century has been a surprisingly stable linear administrative division. So, how did the borderline survive?</p> <p>The creation and maintenance of a contested borderline is a performative process directly connected to socio-political power structures stretching across the border. These processes of border-making in the region are often explored by historians, but the materiality of these same processes has not yet been explored in significant detail by archaeologists. This presentation explores the role that landscape played in the negotiation of a medieval border in the developing Anglo-Scottish borderland by investigating the landscape context of sites used throughout the late medieval period as traditional meeting places. These were places where cross-border crime would be tried and important negotiations would be conferred. This presentation highlights a few case studies from a larger project representing the first systematic evaluation of these sites through the late medieval period, a period when the Wars of Independence solidified conceptions of national differences between the English and the Scots. Using a combination of evidence from documentary sources, historical maps, remote sensing data, and quantitative spatial analysis, the presentation pieces together the history and materiality of these places which were directly embedded, both physically and symbolically, into the development of a linear medieval borderline. In combination, these analyses reveal new insights into the role that memory, display, and movement played in the power dynamics which created and maintained the late medieval Anglo-Scottish border.</p>



4

THE DANEVIRKE – A LINEAR BARRIER, BORDER AND PIECE OF REPRESENTATION

**Abstract author(s):** Witte, Frauke (Museum Sønderjylland) - Tummuscheit, Astrid (Archäologisches Landesamt Schleswig Holstein)

**Abstract format:** Oral

The Danevirke is a more than 30 km long system of earthworks, palisades and stone walls in what is now northern Germany. It was built in several phases across the narrowest section of the Jutland Peninsula in the Danish-German borderland. Together with the trading site of Hedeby, the Danevirke was inscribed by UNESCO as a World Heritage Site in June 2018.

2010-2014 the State Archaeological Department of Schleswig-Holstein in Germany and the Museum Sønderjylland – Arkæologi Haderslev in Denmark carried out transnational excavations at the monument. These have led to important new findings, which include i.a. the discovery of the site of a gateway, where major transport routes converged for at least 500 years. Furthermore, C14-dates indicate that the origins of the Danevirke date to before AD 500, making it more than 200 years older than previously thought. During the Early Middle Ages, the Danevirke was reinforced heavily: in the first half of the 8th century, a massive wooden palisade was built and in the second half of the 8th century, a stone wall was added. In the second half of the 11th century, a monumental brick wall was erected by the Danish king Valdemar the Great. The reuse in the 19th century Danish-Prussian war of 1864 and in World War II included, the Danevirke was in use for at least 1500 years functioning as a territorial marker and boundary.

A project is currently ongoing, which aims to publish the results of the 2010–2014 excavations. The paper will outline results and current working hypotheses mainly concerning the Danevirke’s chronology, which will enable us to relate the sites history to specific historical situations and developments, such as i.a. the emergence of the Danish kingdom.

5

MEDIEVAL BOUNDARIES IN THE FLEMISH FLOODPLAIN: DATING THE CREATION AND DEVELOPMENT OF EMBANKMENTS IN COASTAL FLANDERS USING OPTICALLY STIMULATED LUMINESCENCE

**Abstract author(s):** Vervust, Soetkin (VUB - Vrije Universiteit Brussel) - Kinnaird, Tim (University of St Andrews)

**Abstract format:** Oral

Water management is a key element in the history of Coastal Flanders. Nowadays, hundreds of kilometres of manmade dikes and channels characterise the region’s landscape and contribute to its unique historical value. This is a fairly recent development: for most of the early medieval period the Flemish coastal plain was an unembanked tidal marshland, with small settlements concentrated on higher ground. A major transition in landscape and society occurred in the 9th-11th centuries, when all over the North Sea area people started to transform the tidal plain through a progressive process of systematic embankment. This is believed to have developed in three stages, from the creation of small ring dikes (9th-10th centuries), over dikes alongside tidal channels (10th-11th centuries), to dikes parallel to artificial drainage channels and the coast (starting in the 12th-13th centuries and continuing up until today). However, absolute dating evidence to complement and improve this relative chronological framework is still largely lacking. Most conventional dating techniques (e.g. references in medieval texts, retrogressive analysis, archaeological excavation with artefact-based dating or radiocarbon dating) have particular shortcomings, limiting their usefulness for dating these types of earthworks. Instead, the project presented here used an innovative optically-stimulated luminescence profiling and dating (OSL-PD) method to establish a set of absolute dates for a number of dikes that presumably represent different stages in the embankment process. This allows a more confident interpretation of the construction, use and modification of these earthworks based on the soil within them, and helps us better understand the long-term evolution, fundamental characteristics and historic importance of the Flemish coastal landscape, which is facing challenging transformations in an era of climate change and sea level rise.

6

DIGITISING OFFA’S DYKE: INVESTIGATING AFFECT, AGENCY AND POWER IN THE EARLY MEDIEVAL LANDSCAPE

**Abstract author(s):** Delaney, Liam (University of Chester)

**Abstract format:** Oral

The enigmatic Offa’s Dyke has long been understood as a demonstration of the power of the Mercian state in the long 8th century. Rarely have previous studies involved anything more than the visual observations of the earthwork. With such a huge linear monument, surveys from a ground-level perspective cannot possibly contextualise its total breadth of the monument. The shortcomings in the quality of data on the Dyke has led to uncertainties and debate over its route, extent and placement of it in the landscape. With the application of lidar and other digital technologies, my ongoing doctoral research is providing a fresh understanding of the nature and original extent of Offa’s Dyke’s route by employing an empirical dataset.

My digital dataset for Offa’s Dyke not only is identifying hitherto unknown sections of the monument, it is providing the foundation for new investigations of the nature of the frontier in the 8th century, but also it will assist investigations of the relationship between patterns in landscape use (such as re-use of existing monuments, or natural features like rivers) and possible intentionality in the Dyke’s placement that landscape.

This paper presents interim results, shedding fresh perspectives utilising digital heritage tools and data sources to examine and re-evaluate evidence of the nature of the dyke and the wider Mercian frontier.

7

OFFA’S DYKE AND THE IMAGINATION OF THE ANGLO-WELSH BORDERLAND

**Abstract author(s):** Belford, Paul (Clwyd-Powys Archaeological Trust)

**Abstract format:** Oral

Offa’s Dyke is the UK’s longest linear earthwork, stretching for over 120km through the borderland between England and Wales. Recent scientific dating evidence has confirmed its association with King Offa of Mercia, and therefore its construction in the late-eighth century. It delineated the western edge of Offa’s kingdom in opposition to the Welsh polities, and also had a symbolic function articulating Offa’s power both at home and abroad. Its role as an administrative boundary – if it ever was such a thing – was short-lived; the modern border between England and Wales was fixed in the 1530s and is not generally contiguous with the Dyke. Nevertheless ‘Offa’s Dyke’ is widely used as a shorthand for the border, and the earthwork itself has helped create a space in both English and Welsh imaginations which is neither one nor the other but has its own identity as the ‘Anglo-Welsh borderland’. This paper will look at the later biography of Offa’s Dyke, and its role in constructing medieval and post-medieval administrative divisions, before considering more deeply the presence of the Dyke in the early modern imagination. In particular it will explore the way the Dyke is situated in discourse around modern cultural identities, and how contemporary understanding of identity is framed through archaeology and heritage. Public awareness and support is essential for the long-term conservation of the monument, and the role of archaeology in engaging with a variety of non-specialist audiences is critical. The paper explores how archaeological research can interact meaningfully with contemporary discourse around identity and belonging in a border landscape.

8

OF MERCIA, MONUMENTS AND MYTHS: REINTRODUCING COMPLEXITY INTO TWENTY-FIRST CENTURY ENGLISH ORIGIN NARRATIVES

**Abstract author(s):** Roxby-Mackey, Melanie (University of Birmingham) - Mackey, Ian (Worcestershire Archives and Archaeology Service)

**Abstract format:** Oral

Borders are back, but did they ever go away? The forces driving our increasingly inter-connected, globalised world have, it seems, failed to eradicate our millennia-old instinct to build and destroy barriers between ‘us’ and ‘the other’. Contemporary border scholarship is, not unreasonably, primarily concerned with the here and now, but how can we hope to understand our modern world without framing our discussions within the context of our collective past? Should we, in fact, be considering the possibility that we are not as unique in the twenty-first century as we imagine? If so, what role can early medieval liminal landscapes play in these discussions? Within the context of the UK at least, the answer is quite a significant one.

Increasingly, English origin myths are bound up with King Alfred and the primacy of the Kingdom of Wessex. These are powerful nationalist narratives easily perpetuated in support of populist agendas, but what is their basis? History is written by the victors, whether they be in Wessex, or post-Brexit Britain. But what of evidence from the landscape? Ambitious leaders monumentalise borders whether they are Trump in the US, or Offa in eighth-century Mercia. Meanwhile, populations living in these liminal spaces leave their responses to these events in myriad ways, along the Anglo-Welsh border 1,200 years ago, today’s border in Ireland, or that between the US and Mexico.

By adopting an interdisciplinary framework derived from landscape archaeology, border studies, linguistics and psychology it is possible to say something of both the early medieval Anglo-Welsh border and our contemporary world. The evidence speaks to us of complex, multi-vocal environments subject to both spatial and temporal change at a range of scales. Ultimately, it suggests that in multi-generational terms at least, borders change, but it is our enduring curiosity about each other that prevails.

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BUILDING NETWORKS! THE EXCHANGE OF KNOWLEDGE, IDEAS AND MATERIAL FOR BUILDING IN THE MEDIEVAL AND POST-MEDIEVAL WORLD

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands) - Patrick, Laura - Berryman, Duncan (Queen’s University Belfast) - Huggon, Martin (Bishop Grosseteste University)

**Format:** Regular session

The development of buildings in medieval and post-medieval Europe cannot be seen as an isolated process within the boundaries of a town, region or even country. During these centuries there was always an exchange of aesthetic ideas, technological know-how, and building materials. It is known that architects and craftsmen travelled throughout Europe to build, for example, churches and castles. Some of the technological knowledge was closed for outsiders, heavily guarded by the master and his pupils. The building material could also be imported from afar, like tuff brick and wood. Also, the introduction of new concepts was distributed along certain existing networks. For example, the Crusades had an impact on the buildings of medieval Europe on several levels.

In this session we would like to explore these networks. What were the extents of these networks? How far did these networks reach? Can we identify the main players? How does the exchange and distribution of ideas, knowledge, and materials relate to other developments within the medieval and post-medieval world, like the growing urbanisation and globalisation, and the rise and fall of trade-networks like the Hanse and climate-change? How were new concepts adopted and possibly adapted?

We welcome contributions from Europe and outside of Europe to discuss and better understand the patterns behind these ex-



changes. At the end of the session we hope to have a first glimpse of the exchange of ideas, knowledge and materials and also more sight on the indicators for this exchange.

ABSTRACTS

- 1

### WHERE DID THE BUILDINGS COME FROM? SOURCES OF BUILDING MATERIALS IN LATER MEDIEVAL ENGLAND

**Abstract author(s):** Berryman, Duncan (Queen’s University Belfast)

**Abstract format:** Oral

Modern construction projects source their materials from builder’s merchants and warehouses. Medieval buildings, however, did not have access to such sources. These buildings used natural materials found within the landscape. Many materials were sourced from within the manor or from nearby manors, but some came from much further afield. This paper will discuss sources of building materials in medieval England. This work will utilise archaeology and manorial accounts of a sample of manors, covering different types of landscapes and lordships. Knowledge of the origins of materials will develop our understanding of trade networks in England. This will be particularly informative with reference to the rural landscape. Trade in rural England has been neglected in comparison to the relatively well understood urban hubs. This paper seeks to use the trade in construction materials to increase our understanding of these networks. It will also consider the reuse of building materials and the trade of such materials. This is an important and significantly understudied aspect of trade that can reveal much about medieval attitudes to materials and resources.
- 2

### HOW TO BUILD A PALACE: MAPPING THE SUPPLY NETWORK FOR THE CONSTRUCTION OF HAMPTON COURT PALACE

**Abstract author(s):** Jackson, Daniel (Historic Royal Palaces)

**Abstract format:** Oral

This paper will examine the local, national and international sources for the supply of labour, materials and architectural knowledge during the construction of Hampton Court Palace in the early 16th century.

Hampton Court is a royal palace nestled on the edge of London. Starting in 1514 a pre-existing moated manor house was transformed into one of the grandest palaces in Europe. The project was initiated by Cardinal Wolsey, then completed by Henry VIII following Wolsey’s fall from power. The scale of the construction effort, under Henry VIII alone almost 26 million bricks were purchased between 1528 and 1538, required an extensive and complex supply network.

The national archives in London hold a large collection of building accounts related to the construction of the palace. This documentary resource often includes geographic details relating to the supply and transportation of specific materials and labour. When combined with the surviving architectural and archaeological evidence, it is possible to illustrate much of this supply network in some detail.

Cardinal Wolsey and Henry VIII were both seeking to construct a palace that would compete with the finest buildings in Europe. To this end they built nearly continuously at Hampton Court for over 20 years. Labour and raw materials flowed into the palace from hundreds of different locations across the UK. English, Dutch, French, German, and Italian workers are identifiable in the building accounts and the influence of international style is evident in the surviving architectural and archaeological remains.

Through analysing the data from Hampton Court Palace, a picture of the complex supply networks required to enable the construction of elite architecture in the early 16th century is revealed.
- 3

### CHURCH ROOFS IN A FRONTIER REGION – HISTORIC TIMBER STRUCTURES IN WESTERN SWEDEN REFLECTS CHANGING INFLUENCES AND RESOURCES

**Abstract author(s):** Gullbrandsson, Robin (Västergötlands museum; Department of Conservation, University of Gothenburg) - Hallgren, Mattias (Traditionsbärarna) - Linderson, Hans (National Laboratory of Wood Anatomy and Dendrochronology, Department of Geology, University of Lund) - Melin, Karl-Magnus (Knadriks Kulturbbygg AB; Department of Conservation, University of Gothenburg)

**Abstract format:** Oral

Western Sweden comprises the three landscapes of Bohuslän, Halland and Västergötland. Up until the 17th century they belonged to three different kingdoms: the norwegian, the danish and the swedish, as well as three dioceses, thus forming a dynamic frontier region. In 2016–2019 a survey was done of preserved medieval roof structures in churches of the diocese Gothenburg. Some 20 churches have more or less preserved roof structures dating from the 13th to the 16th centuries. 17 of these were examined together with researchers in craft science and dendrochronologists. The constructions reflects craft traditions, resources and society. Different traditions indicates influences from Norway, Denmark and Germany. The majority of the examined roofs are dendrochronologically dated to the late medieval age, mainly the 15th and 16th centuries, a period of regained power after the crises of the 14th century. This was the time of the Nordic Union and an increasing trade, leading to urbanization along the coast and big rivers with presence of german merchants and probably also foreign carpenters. Did the building activities in the cities affect construction of church roofs in the countryside? The 16th century brought for example about some impressive framed structures, similar to

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### STONEMASON’S MARKS AND BUILDING NETWORKS IN MEDIEVAL NORWAY

**Abstract author(s):** Reinfjord, Kristian (University of Bergen)

**Abstract format:** Oral

Stone building was an exception in Medieval Norway. Wood was the preferred material, as seen in stave churches and timber core lofts, and only around 350 stone structures survive from Norway AD 1100-1500. Primarily, the church in addition to the King, controlled and used stone technology. Skilled masons and artisans gathered in building huts at the five cathedrals. Stone buildings of Medieval Norway show regionalism, expressed in stylistic- and technological features. However, the archaeological material indicates an exchange of ideas and knowledge, assuming networks between building huts/milieus. Such networks of technological expertise are particularly evident according to stonemason’s marks, where the same marks/builders can appear among different buildings. These marks were personal signatures of each mason, used to identify individual work to the paymaster, but the stonemason marks allow us to trace specific individual hands in networks across distances. The proposed paper discusses how trans-regional building networks could function in late medieval Norway. How can an archaeological material can broaden our knowledge on relationships between central and more rural areas, and between building huts? Taking the advantage of a newly discovered set of stonemason’s marks from the Hamar cathedral, I argue that the technological skill of building advanced architectural elements, such as cross vaults, came from a leading building hut at the Nidaros cathedral of the archbishop, sporting travelling masons in an eastern Norwegian building network. Together with architectural evidence and written sources, stonemason’s marks also contribute in nuancing building chronologies at the Hamar cathedral and the structure of stone technology.
- 5

### THE INTRODUCTION OF STONE ARCHITECTURE IN DENMARK – NETWORKS OF KNOWLEDGE AND MATERIALS IN A LANDSCAPE WITH LIMITED STONE RESOURCES

**Abstract author(s):** Søvsø, Morten (Museum of Southwest Jutland)

**Abstract format:** Oral

Stone architecture using lime mortar was introduced in Denmark during the reign of Cnut the Great (1016/18-1035) most likely by masons coming from England. Before 1300 more than 2000 parish churches were built across the country. Many of these stone buildings are still standing and through their different materials they tell a multi-faceted story of wide-ranging networks of materials and knowledge.

The paper outlines the different types of materials used in church architecture between the 11th and 13th century. The types of stone reflect both the geology of Denmark and cultural contacts across the North Sea, towards the Weser, Rhine and Maas rivers and across the Baltic.

The earliest churches were all built from calcareous tufa coming from local sources sometimes combined with undressed, local moraine stone. By c. 1100 large-scale quarrying and long-distance transport of materials (up to 1000 km) were introduced at the cathedral building sites in Lund, Ribe and Schleswig. At Viborg cathedral local moraine blocks of granite were transformed into beautiful ashlar and this technique was used in hundreds of parish churches across Jutland.

In parts of Eastern Jutland and Eastern Zealand with access to local limestone this material was also used but did not travel long distances.

The earliest examples of brick architecture dates from shortly after 1150 when a refectory building was erected at Ribe Cathedral using probably imported bricks. Later in the 12th century locally produced bricks were used in cathedrals and large abbey churches. From c. 1200 this material was dominant.

Throughout the period in question the bishops, who commissioned the building of cathedrals and oversaw the associated workshops, seem to have been the key players.
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### INFLUENCERS IN DANISH BRICK ARCHITECTURE

**Abstract author(s):** Gardelin, Gunilla (Kulturen)

**Abstract format:** Oral

Throughout history, people have expressed themselves through architecture and it can be seen as driving force to bring about change. During the mid-12th century, there are indications that the initiative to start building with bricks in Denmark came from the Hvide family. By participating in wars and crusades in northern Europe, they became acquainted with brickwork technique.

The Hvides’ earliest brick buildings date from the 1160-1170s. The knowledge of brickwork was passed on from this family to others. During the Middle Ages monasteries and convents played an important role in preserving the knowledge of how to make bricks. This changed with the Reformation of the Catholic Church which took place in 1536. The State gained control of the Church and its properties, thereby gaining new resources used for erecting new buildings. At estates belonging to the King and at former

7 monasteries, a couple of hundred thousand of bricks were produced for the construction of a new castle in Malmö in 1536-1542. It could be argued that the State appropriated the monasteries’ resources, knowledge and the organization needed to produce bricks. Another influencing factor was the difficulties that affected the Hanseatic League during the 16th century. At that time, the Netherlands became more active in the trade in the Baltic Sea. Denmark suffered wars during the 15th and 16th centuries and as a result, the nobility needed to restore or rebuild its estates. These buildings feature the distinct influence of the Dutch Renaissance style. The topic of this presentation is to submit an interpretation of who played significant parts in the developments of Danish brick architecture between the 12th and the 16th centuries. The analysis also aims to show how these architectural changes are connected to changes in politics, religion and the alteration of trading partners in the Baltic Sea.

7 **AN EXCEPTIONAL 12TH CENTURY TILE FLOOR IN THE TOWN OF ROSKILDE, DENMARK – ORIGINS AND THE NETWORK BEHIND IT?**

**Abstract author(s):** Langkilde, Jesper (ROMU, Roskilde Museum)

**Abstract format:** Oral

In the medieval urban parish church of St. Lawrence in the center of Roskilde, Denmark, an exceptional tile floor was excavated in 1931. The church had several building phases: originally build as a wooden church in the 11th century; the church was rebuild as a Romanesque stone (travertine) building around 1125, which had a gothic extension and vaults in brick added in the 13th century, along with an added porch in the 14th century and a tower around 1500. In the time of the Reformation in the 1530’s the church was demolished. The excavated and partly preserved tile floor was made of red- and grey-fired unglazed earthenware tiles, with square tiles laid in checkerboard-pattern surrounding a central rosette made from concentric circles of triangular tiles. The floor was the second floor of the Romanesque church, and should most likely be dated within the period 1140-1200. The introduction of tile and brick in Denmark is usually dated around 1160 and the floor is thus among the earliest examples. No parallels have so far been found in Denmark or Scandinavia. Maybe parallels should be looked for in European Cistercian architecture? New results of chemical provenancing by ICP of the floor tiles will be presented. The paper will thus touch upon the question of the important introduction of tile and brick technology and architecture in Denmark and the Baltic region and the networks behind it.

8 **BRICK BY BRICK: THE USE OF BRICK BETWEEN THE 12TH AND 16TH CENTURY IN THE NETHERLANDS**

**Abstract author(s):** Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

**Abstract format:** Oral

In modern Dutch towns, brick is the most common building material. The brick buildings in historic towns are mostly dated between the 16th-20th century, while most people associate the older buildings with the Middle Ages. But before the 16th century, brick was far less common as a building material than often is assumed. In my paper I would like to go deeper into the use of brick from the first use of brick at the end of the twelfth century towards the sixteenth century and explore what happened within these four centuries. The first use of brick wasn’t just a success story. It was at first a more secondary building material while tuff (quarried stone, mostly in Germany) was preferred. Factors like changes in the landscape played an important role in the first appearance of brick. After that, there are several phases to discern in the growing use of brick as building material. Availability, status, trade and knowledge, all with their underlying networks played key-roles in the further spread of brick as building material. But also city fires and subsidies by local governments were essential for this process. My focus will be on the different stages of this process, the key elements within each stage and how they were connected. This knowledge helps us to understand the genesis from the medieval to historic towns of today.

9 **CARRICKFERGUS CASTLE 1178-1242. CULTURAL INFLUENCES AND NEW IDEAS IN THE MAKING OF AN ANGLO-NORMAN FORTRESS IN ULAIDH**

**Abstract author(s):** Botturi, Chiara - O’Keeffe, John - MacRandal, Dermot (Department for Communities of Northern Ireland, Historic Environment Division)

**Abstract format:** Oral

Dominating a dolerite outcrop strategically located on the northern shore of Belfast Lough, Carrickfergus Castle was built as a fortress and dwelling by John de Courcy ca 1178. Symbol of the Anglo-Norman control over the northern territories of the Kingdom of Ulaidh, it came into different hands throughout the 750 years of its use, which continued well into the modern era only to end less than a century ago, when the Castle was taken into State Care by the Department of Communities of Northern Ireland. Conservation works (March 2019/January 2020) for the replacement of the roof of the Great Tower presented the opportunity to explore this building in depth and led to the discovery of crucial evidence for its interpretation. New elements were uncovered, which shed light especially on the years 1178-1242 – which saw John de Courcy’s activity, King John’s works, and Hugh II de Lacy’s developments. This paper puts forward a revised chronology for the Great Tower, and discusses the rationale and influences behind specific construction choices. It will be explained how the Tower was subject to at least three extensive alterations in its design. Initially a three-storey building, it was then turned into a much more imposing four-storey tower (with sunken roof and hoardings), subsequently enhanced by the creation of a great chamber at top floor, spanned by a majestic stone arch. Starting from this, we aim to answer questions such as ‘what were the cultural influences for the very first design?’ and ‘where did the new ideas and innovations,

which informed the modifications occurred from the second decade of the 13th century, come from?’ The comparison with similar monuments in Ireland, Great Britain and Europe provides us with further insights on the matter, and helps us unravel the complex history of the Castle on Fergus’ rock.

10 **MEDIEVAL ARCHITECTS: WAS THE EARLY DEVELOPMENT OF CARRICKFERGUS UNDER THE ANGLO-NORMANS INFLUENCED THROUGH THE CONTEMPORARY CULTURAL NETWORKS EXPANDING ACROSS EUROPE?**

**Abstract author(s):** Patrick, Laura (Queen’s University Belfast) - Logue, Paul (Historic Environment Division, Department for Communities)

**Abstract format:** Oral

The Northern Irish town of Carrickfergus, County Antrim, has its origins in medieval Ireland, and owes its foundation to the Anglo-Norman knight John de Courcy, c1178/9. Despite the fact that the town is situated on the periphery of the European community, early established networks and connections are evidenced in the medieval building styles and artefacts uncovered over 50 years of excavation and research. Given that the town was under the lordship of Hugh de Lacy, during the first half of the 13th century, links with France are unsurprising. Whilst Carrickfergus Castle undergoes continuous investigation, comparable research into the early development of the town, including its buildings, is in some cases lacking.

This paper looks at the town’s development during the rule of Hugh de Lacy, and the mark he left on the medieval townscape: from the establishment of a Franciscan Friary, to the realignment of the town defences, and the construction of hall houses along the town’s arterial routes. As de Lacy travelled across the continent, England and Ireland, was he influenced by places he visited, and can comparable examples be identified?

Following the 13th century did these pan-European networks continue, and how was the later medieval town influenced by contemporary ideas in architecture and social development? Have the later alterations to building styles concealed the initial designs of the Anglo-Normans in medieval Carrickfergus?

11 **THE BUILDINGS OF THE MILITARY ORDERS IN ENGLAND: INITIAL INVESTIGATIONS INTO THE ARCHAEOLOGICAL EVIDENCE FOR THEIR VARIED ROLES AND INFLUENCES**

**Abstract author(s):** Huggon, Martin (Bishop Grosseteste University)

**Abstract format:** Oral

This paper will set out initial research on the buildings of the Military Orders in England and begin to explore some of the potential influences that structured the form they took and the roles they played, both within the Orders themselves, but also more widely. Whilst there has been a focus on the archaeological evidence for these Orders in the Holy Land there has often been a lack of wider discussion of evidence from the territories that supported their military role. As sites of religious, economic, social, and military activity, important questions remain about how buildings structured the daily routines of the residents of the varied commanderies, preceptories, and hospitals across England. How influential were design principles from Military Order sites in the Holy Land upon English sites, and how did these interplay with wider religious, social, and economic influences at play in the Kingdom of England during the medieval period?

The status of the Military Orders as both a religious and a military entity has often been a focus of discussion, but looking more widely at their presence across Europe there are a number of other influences and roles that may equally be important to engage with. Although serving as centres for economic production to support military action, they also provided hospitality to pilgrims and travellers, served as both training stations and retirement posts for the Orders’ membership, and were also centres of religious practice. This mix of roles and influences are as complicated as any affecting monastic orders, yet have seen much less investigation. It is hoped that this paper will be the start of a wider discussion about the way that archaeological investigation can add new dimensions to our understanding on the influences and roles of these sites.

12 **BUILDING NETWORKS! CIRCULATION OF WORKFORCES, TECHNIQUES, ARCHITECTURAL MODELS: ROMA AND THE LAZIO REGION IN THE ITALIAN AND EUROPEAN CONTEXT**

**Abstract author(s):** Giannini, Nicoletta (Università Roma Tor Vergata)

**Abstract format:** Oral

The present contribution offers a picture of the Building Networks identified in the study on medieval housing construction made in Rome for the ERC Project “Petrifying Wealth. The Southern European Shift to Masonry as Collective Investment in Identity, c.1050-1300 is a European Research Council Advanced Grant (GA N° 695515)”. By analysing building types and techniques in a long time period (5-15th centuries), the research allowed to identify the exchange of aesthetic ideas, technological know-how, and mostly of building materials with the close periphery. This also allowed to define, through to the same elements, areas of change and/or influence, to recognize the introduction of new models and techniques and also building technology often coming from far away. It was therefore a critical contribution to the debate on Building Networks and in particular on the circulation of workforces and on the meaning that is often tied to the frequent use of certain architectural models outside of local traditions. Thanks to particularly important case studies, the potential of the city in attracting and accepting new building models and new housing types will be high-

lighted, as well as the role of political and social actors in this exchange of ideas and workforce circulation, in light of the socio-economic context and of the weaving of relationships and connections made by the city or single characters across Italy and Europe. The present paper aims therefore at suggesting a new way of looking at building activities in Rome during the Middle Ages, certainly steeped in the great tradition of its past, but also a point of reference in Europe across the centuries examined in this context. In this way we can reflect and better understand the patterns behind these exchanges.

NETWORKS OF TRANSMISSION: THE SYNTHRONON IN THE EARLY CHRISTIAN CHURCHES OF CENTRAL LYCIA

**Abstract author(s):** Scardina, Audrey (University of Edinburgh)

**Abstract format:** Oral

The synthronon, a set of semi-circularly arranged benches in the main apse of a church (Krautheimer 1986, 520), is a recognizable architectural feature which can often be discerned in both archaeological excavations and surveys. While research on Lycia, and many other regions on the Mediterranean coast of Anatolia, note the absence or presence of a synthronon in the apse of early Christian churches, few scholars consider why this architectural feature does not appear consistently. Central Lycia, centred on the ancient city and bishopric of Myra, provides an ideal study area both for the number of research projects carried out in the region, as well as the dry climate and sparse population, which has allowed for many of the church ruins to go relatively undisturbed except for by nature.

This paper will provide a quantitative analysis of the 162 recorded early Christian churches (5th – 13th century) of Central Lycia, with reference to the absence or presence of a synthronon in the apse. The churches themselves will be considered within a cultural evolutionarily framework, where the transmission of cultural traits, through a process of ‘descent with modification’ (Mesoudi 2016), informs the methods of quantitative analysis. First, I will consider whether or not a church with a synthronon performs a specific function, and then I will analyse any regional and temporal variation amongst the dataset. This process highlights the networks of transmission visible in the relationship between the synthronon and other traits, such as nave area, construction technique, sub-regional variation, and other decorative features. In doing so this paper highlights the need to consider such architectural traits more carefully, as without doing so we may miss the nuance in the relationship early Christian communities had with the many churches in their landscape.

ARCHITECTURAL MOTIFS WANDERING THROUGH ROYAL COURTS, BARONIAL CASTLES AND NOBLE DWELLINGS IN THE LATE MIDDLE AGES

**Abstract author(s):** Nagy, Szabolcs (Eötvös Loránd University, Budapest)

**Abstract format:** Oral

Residences built during the Late Middle Ages at well accessible sites with a regular ground plan organization and with definite claims of comfort, prestige representation and military character represent a special group of medieval architecture in Central Europe. They appear not exactly as a new type of noble dwellings rather as a combination of two former types, melting the defensive and representative role of castles on the one hand and the comfort and well accessibility of manor houses on the other. The spread of certain ideas concerning space management as well as certain architectural motifs is clearly evidenced, however, the reasons behind this development is less obvious. It seems crucial to make an attempt separating wide-spread popular features of contemporaneous residence architecture from special phenomena testifying a closer imitation of courtly architecture and delivering a more direct message. These investigations can reveal various forms of social display realized at a residence type which might be considered special forerunners of the early modern mansions and castles.

PRAGUE AND PRAGUE CASTLE UNDER THE FIRST HABSBURGS

**Abstract author(s):** Blažková, Gabriela Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague)

**Abstract format:** Oral

The ascent of the Habsburgs to the Bohemian throne in 1526 marked a great change for the Czech Lands and for the city of Prague itself. The Renaissance brought by the Habsburgs meant not only the emergence of a new architectural style but also a new concept of life with a broad impact on everyday existence. These changes were conditioned to a significant extent by an influx of new residents from the newly established Habsburg Empire.

The new lifestyle was most apparent in the capital of the Kingdom of Bohemia – Prague, whose dominant landmark, Prague Castle, was rebuilt with contributions from foreign builders into a modern and representative residence. The unused land immediately north of the Castle was incorporated into the complex by means of a wooden bridge, and this area became home to the vast Royal Gardens with free space for grand architectural projects. The extensive blaze that struck the right-bank Prague quarters of the Lesser Town and Hradčany in 1541 became a genuine catalyser for the intensive arrival of the Renaissance in the entire city. The now-vacant and often combined parcels of the fire-ravaged medieval houses induced feverish building activity among aristocratic families. The construction of urban palaces in the 1540s and 1550s transformed the face of Prague and spelled the absolute victory of the Renaissance style. The arrival of foreigners is closely tied to the elevation of Prague to the imperial residential city under Emperor Rudolf II. Regarded as proficient and skilled builders, Italians made a major contribution to the building activities throughout the city. The transformation process of medieval Gothic Prague into an Early Modern agglomeration was completed in the mid-17th century.

THE RURAL ECONOMY IN TRANSITION: AGRICULTURE AND ANIMAL HUSBANDRY BETWEEN THE LATE ROMAN TIMES AND THE EARLY MIDDLE AGES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Grau-Sologestoa, Idoia (IPNA/IPAS, University of Basel) - Rizzetto, Mauro (University of Sheffield) - Davies, Tudur (Cardiff University)

**Format:** Regular session

The collapse of the Roman Empire and the long formation processes of medieval societies throughout Europe constitute two major themes in both historical and archaeological research. Most archaeological research has been carried out on settlement patterns, architecture and material culture, showing a picture of instability, radical changes in settlement patterns and the termination of most trading routes. Rural economy, however, has received less attention, and this is somewhat surprising, as these major socio-political upheavals must have had a tremendous impact in the lives of the European rural population and their most basic economic activities: animal husbandry and agriculture.

The introduction of Roman husbandry practices is known to have impacted considerably on the rural landscape, plant cultivation and animal management in the various provinces of the Empire, with a high degree of specialisation of economic activities. In many cases, the subsequent decline of the Roman political and economic structures led to less specialised, more local, smaller-scale, self-sufficient subsistence economies. We now understand that the collapse of the Roman Empire and the development of medieval socio-economic structures had important consequences in rural economy, mainly in relation to the end of market-oriented production and a significant decrease of urban demand of agricultural products.

Recent research has shown the potential of archaeological sciences in addressing these issues and, for this reason, the main aim of this session is to bring together researchers from different archaeological disciplines (such as archaeobotany, palynology, zooarchaeology, geoarchaeology, landscape archaeology, etc.) to explore common patterns and dissimilarities in the ways that rural economies changed or adapted to the new socio-political scenarios as the result of the collapse of the Empire and the formation of medieval economies. We particularly welcome interdisciplinary papers which involve the integration of different scientific methods.

ABSTRACTS

THE ROLE AND MANAGEMENT OF DOMESTIC FOOD ANIMALS IN ROMAN AND EARLY POST-ROMAN BRITAIN, ANALYSED THROUGH THEIR SIZE AND SHAPE

**Abstract author(s):** Rizzetto, Mauro (University of Sheffield)

**Abstract format:** Oral

In this study, the biometrical evidence from domestic animal remains is used to provide insights on the economy of Late Roman and early post-Roman Britain.

In Roman Britain, food production implied large-scale, intensive exploitation of land and animals, sustained by a functional settlement hierarchy and elaborated distribution networks. Surplus production was instrumental to feed the Roman taxation cycle and to supply consumers located in urban and military settlements. Since the early Roman period, cattle increased in size and robustness, enhancing their traction force in agricultural works and providing larger yield; similarly, the size of sheep and probably pig, horse, and chicken also increased. This study suggests that such husbandry strategies, and especially the maintenance of larger livestock, continued to the very end of the Roman period in Britain. This persistence could indicate that the military-economic crisis of the Late Empire affected Britain differently from other provinces, where cattle decrease in size since the 4th century. At the same time, it highlights the key role played by the Roman state in shaping the economy of the island for almost four centuries.

The study of Early Anglo-Saxon animal husbandry indicates substantial discontinuity in the aims and scale of food production, largely driven by the collapse of the Roman taxation system and the establishment of self-sufficient, isolated communities. Cattle decreased in size, as its central role in agricultural works faded away; sheep, horse, and chicken, on the other hand, were important elements of post-Roman animal exploitation, and their improved size was retained. Similarities and differences with other regions of north-western Europe provide further details on the nature of British animal economies.

Such diachronic comparison mutually reinforces our understanding of Roman and Early Anglo-Saxon animal husbandry, contributing to a better definition of the nature of socio-economic dynamics on both sides of the transition.

SETTLEMENT AND AGRICULTURAL ECONOMY FROM THE POST-ROMAN-EARLY MEDIEVAL PERIOD AT TINTAGEL, CORNWALL: NEW DISCOVERIES AND INSIGHTS FROM RECENT EXCAVATIONS

**Abstract author(s):** Baker, Polydora - Bayliss, Alex - Campbell, Gill (Policy & Evidence: National Specialist Services, Historic England) - Gossip, James (Cornwall Archaeological Unit) - Hazell, Zoe (Policy & Evidence: National Specialist Services, Historic England) - Nowakowski, Jacky (Independent)

**Abstract format:** Oral

Tintagel is a key site for understanding seaways and European commerce and connectivity in the migration period. Recent excavations led by Cornwall Archaeological Unit in collaboration with English Heritage Trust and Historic England have revealed a series



of substantial buildings with walkways and rich, well-preserved middens. This study is part of the multi-disciplinary exploration of the 5th to 12th century midden deposits. The preservation of remains in these deposits is exceptional for western Britain and the results suggest conspicuous consumption of terrestrial resources and imported food products rather than a reliance on marine resources. The zooarchaeological, archaeobotanical and anthracological analyses are integrated with the archaeological data (dating; settlement; deposition history). The paper will explore the organisation of food provisioning and resource use within the settlement and its hinterland from the post-Roman through to the Early Medieval period. The paper will also highlight the application of best practice methods within this unique and challenging setting.

### 3 MAKING THE INVISIBLE VISIBLE – LIVESTOCK EXPLOITATION IN LATE ROMANO-BRITISH AND EARLY MEDIEVAL SOMERSET, ENGLAND

**Abstract author(s):** Randall, Clare (Prehistoric Society; Bournemouth University)

**Abstract format:** Oral

The Late Romano-British landscape of the south-west of Britain, specifically of Somerset, was structured around urban centres, such as Bath, and widespread villa estates. From these we have an impression of the agricultural productive landscape which relied on cattle and sheep and indicates networks of supply from the countryside to the town. By contrast, agricultural production in the centuries immediately following the official disengagement of the Empire from Britain is difficult to ascertain across much of this area, with limited faunal assemblages or indications of landscape use in the forms of fields and boundaries. Utilising recently excavated faunal material and plant remains from Roman Bath, and 7th century Chewton sub-Mendip, alongside re-examination of 5-6th century AD material from the re-occupied hillfort of Cadbury Castle, this paper will frame the questions raised by the similarities and differences in early medieval faunal and plant assemblages compared with those of the late Roman period. It will also consider evidence of both continuity and dislocation of land boundaries. Continuity between the two periods of representation of wild animal species on some sites contrasts with changes in the relative abundance of livestock animals. This paper considers how we might understand use of the landscape during this period, whilst acknowledging the bias in currently known early medieval faunal material to sites of higher status or with possible early ecclesiastical connections.

### 4 PEASANT ENTREPRENEURS : AN EARLY MEDIEVAL MILLING SITE AT ROTSELAAR (FLANDERS, BELGIUM)

**Abstract author(s):** Van der Velde, Henk (Vlaams Erfgoed Centrum; Free University Brussels) - Tys, Dries (Free University Brussels)

**Abstract format:** Oral

In 2015 an excavation was carried out at Rotselaar, in the stream valley of the river Dijle. An area with 52 sunken huts was uncovered. Many of those sunken huts contained rotary millstones, used both for hand milling and a treadmill. Moreover, many pits contained traces of grain. Usually sunken huts are accompanied by houseplans but neither traces of the latter nor settlement refuse were found so it is concluded that these sunken huts were not part of a settlement area. It was established that the site was used between the late 7th century AD and the late 10th century AD. This means that already during the Merovingian period this site was laid out as a special purpose site.

In order to establish the background of this site, an interdisciplinary team carried out landscape research, archaeobotanical analyses (including isotopes), analyses of the mill stones, and historical research. The large scale milling carried out at the site supposes a large surplus production. Besides that, the early dating and the location of the site as a nodding point in the Dijle system (a part of the outstretched Scheld river system) is of interest. Not only because its founders choose to create a site like this at some distance from their settlement but also due to the absence of evidence for the role of elite groups taking part in this. Following recent publications like Loveluck (Northwest Europe in the Early Middle Ages, 2013), we thank that the site was most probably founded and used by a group of peasants. With this contribution we would like to present the data and address the research questions who come with them concerning the (vibrant) nature of the rural peasant economy during the 8th and 9th centuries in the Low Countries.

### 5 FROM VILLAE TO EARLY MEDIEVAL COMMUNITIES IN THE NORTH-EAST OF THE IBERIAN PENINSULA: CHANGES AND CONTINUITIES IN HERDING PRACTICES

**Abstract author(s):** Gallego Valle, Abel - Colominas Barberà, Lidia - Palet Martínez, Josep Maria (Institut Català d'Arqueologia Clàssica)

**Abstract format:** Oral

The development of animal husbandry practices is an important aspect of the study of agro-pastoral societies, as this was influenced by and, at the same time, could influence political choices and cultural practices within communities. Livestock exploitation contributed to the economy and sustainability of societies, providing food resources and other products.

With this paper we want to contribute to this issue, presenting the evolution of animal husbandry practices in the transition from Late Antiquity to the Early Middle Ages in the northeast of the Iberian Peninsula.

To investigate this topic, we adopted an archaeozoological approach focusing on species frequencies, anatomical representation and kill-off patterns. We applied these analyses to the study of faunal remains from eight sites, which include rural settlements,

urban centres and ecclesiastical sites. The archaeological sites are located in current north-eastern Catalonia, an area related to the origins of transhumance in this region in Late Antiquity and Early Medieval times.

Data show fluctuations in animal frequencies between these periods and changes in kill-off patterns. We suggest that these variations reflect changes in herd management and the products obtained from domestic animals, as well as the reorganisation of settlement patterns and landscape transformations.

### 6 LIVESTOCK AS RESOURCE DURING A TIME OF TRANSITION. THE PORT CITY OF CARTAGENA IN LATE ANTIQUITY

**Abstract author(s):** Padilla, Juan (University of Murcia) - Morales-Muñiz, Arturo (Universidad Autónoma de Madrid) - Ramallo-Asensio, Sebastián (University of Murcia)

**Abstract format:** Oral

This work presents the results of the analysis of the bone material from the Byzantine harbor quarter overlapping the Roman theater of Carthago Spartaria (Cartagena, Murcia, Spain). From a broad sample of 2,723 fragments found in debris pits and garbage dumps, the production strategies and the consuming patterns of livestock are established for a historical period of the city in which its appearance has nothing to do with the monumental image of a Roman town. The use of mixed farming is established, with a predominance of caprine and bovine versus a scant presence of suids and equines, as well as wild hunted fauna. Most of the animals, with the exception of goats and pigs, as well as certain bovines, were sacrificed in full adulthood. This implies that both their secondary products and their draft force were used. Livestock managing is confirmed as an important economic activity, at a moment when agricultural exploitation of the environment undergoes substantial diminishing based on the disappearance of the vast majority of rural sites from preceding decades. The represented livestock and the herding and maintenance conditions contribute to provide a “rural-like” image of the old Hispanic capital.

### 7 A LAGOON IN TRANSITION: JESOLO AT THE EDGE OF VENICE

**Abstract author(s):** Cinciosi, Alessandra - Gelichi, Sauro - Garavello, Silvia - Forti, Alessandra (Ca' Foscari University of Venice)

**Abstract format:** Oral

In the centuries following the decline of the western Roman empire, a historical period traditionally interpreted as a phase of crucial transformations for the western Mediterranean, coastal and lagoon sites in the upper Adriatic Sea represent an extraordinary novelty for northern Italy.

The landscape in which these settlements developed is the lagoon, characterised by the presence of islands or ridges. Among these sites stood out Jesolo (in the northern Venetian lagoon), known in ancient times as ‘Equilus’ or ‘Equilius’. Its geographic position, between mainland and sea, favoured the consolidation of an economy based on the exploitation of local resources. Despite the recent massive land reclamation works, the archaeological deposit is very well preserved and has been investigated between 2013-2016 by Ca' Foscari University of Venice.

The settlement of Equilo developed during the 4th-5th centuries, when a ‘mansio’ was founded; it was used as a resting and exchange station for officials, soldiers and postal services that travelled from Altino to Aquileia using waterways along the ‘cursus publicus’. The community that was settled at the Equilo’s ‘mansio’ lived out of fishing, livestock and agriculture, developing also crafts, such as ironworking, and the processing of bones and horns.

During the Early Middle Ages, the settlement underwent significant changes, due to the establishment of the Diocese of Equilo. The archaeological record is mainly represented by storage structures, which produced a considerable amount of bioarchaeological material.

In this paper, we aim to outline the transition of a rural economy from the Late Antiquity to the Middle Ages in the lagoon environment of Jesolo, as reflected by the analysis of archaeobotanical and zooarchaeological remains.

### 8 RURAL ECONOMIC CHANGES IN SICILY BETWEEN LATE ANTIQUITY AND EARLY MIDDLE AGE: THE CASE OF VILLA DEL CASALE

**Abstract author(s):** Scavone, Rossana (Università degli Studi di Verona)

**Abstract format:** Oral

The changes in the Roman politics during Late Antiquity had important consequences on the economic structures of the Empire and the economic administration of Roman Villas in the North and South of Italy. At the beginning of the 4th century, the displacement of the capital city from Rome to Constantinople also led to the transfer of the Annona (grain distribution administration) to the new capital city. At the same time the city of Rome relied heavier on food production from southern Italy. This process generated an increase in cereal cultivation and meat export, consequently stimulating a change in animal husbandry in southern Italy and in the Villas economy that managed food production. Hereafter, the loss of power of the senatorial class and the transfer of villas’ management to the Church or other owners caused variations in the economic activity of Villas. These processes can be effectively observed from the zooarchaeological analysis of Villa del Casale in Piazza Armerina, Sicily. Our analysis shows that from 1st to 3rd century AD the site was a rural villa for the breeding especially of small livestock. After the end of the 3rd century and during the 4th century AD it became a magnificent villa producing wheat and grains for the Urbe. Later, during 5th-6th centuries, the site focused

on animal breeding, specialising in pork, sheep and goat. The history of Villa del Casale is similar to other Villas in southern Italy, suggesting that economic changes in this part of the Roman Empire during Late Antiquity were not necessarily a sign of decline.

## 9 CHANGES IN LIVESTOCK MANAGEMENT BETWEEN THE LATE ROMAN AND EARLY MEDIEVAL PERIODS IN THE BALKAN DANUBE REGION: EVIDENCE FROM SERBIA

**Abstract author(s):** Markovic, Dimitrije - Vuković, Sonja (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade)

**Abstract format:** Oral

The weakening of the Roman Danube limes in the course of the 4th and 5th centuries AD, caused by the invasions of Germanic tribes and of the Huns, brought about the destruction of the once-powerful Roman fortifications and towns within the borders of the Balkan provinces of the Empire. According to historical and archaeological research, it is well known that a significant ruralisation of former Roman cities and fortifications took place. Although it is plausible to suspect that such developments impacted greatly on livestock management practices, direct evidence on changes in animal exploitation is missing due to the absence of faunal assemblages from the transition period between Late Roman and Early Medieval times.

This paper aims to explore this topic, by integrating the scarce archaeozoological data from the periods in question from the Danube region in Serbia. We will analyse and compare species frequencies and biometrical data of the most common domesticates from two temporally distant (but so far the only available) faunal assemblages, i.e. the one from the Late Roman layers of the city of Viminacium (4th century AD; analysed by the authors), and that from the Early Medieval features of the fort of Pontes (9th/10th century AD; published by L. Bartosiewicz in 1996). In order to bridge the significant chronological gap between these two sites, we will also discuss specific archaeological finds from the fortifications, which might be considered as indirect evidence of animal husbandry strategies, as well as published archaeozoological data from sites located in the hinterland of the Central Balkans. This will allow to characterize changes in livestock management from the Late Roman to the Early Medieval periods in the Danube region of present-day Serbia.

## 10 LATE ROMAN ZOO-ECONOMICAL TRANSITIONS FROM WESTERN PANNONIA (PODERSDORF AM SEE, AUSTRIA): ARCHAEOLOGICAL, ARCHAEOZOOLOGICAL AND GEOARCHAEOLOGICAL CONTEXT

**Abstract author(s):** Saliari, Konstantina (Natural History Museum of Vienna) - Tobias, Bendeguz (Austrian Academy of Sciences) - Draganits, Erich (University of Vienna)

**Abstract format:** Oral

Since 2015 systematic research excavations at Podersdorf am See, a village directly east of Lake Neusiedl/Fertő tó in the western-most part of the Pannonian Basin, brought to light several archaeological sites and abundant finds dating from the Roman period to the High Middle Ages. The archaeological site presented here is located 1.7 km east of Lake Neusiedl, in a flat, slightly raised area, which is usually dryer than neighbouring spaces. During the excavation campaigns 2018-2019, settlement features were discovered with a respectable number of archaeological finds and biological remains dating from the Roman period to the Late Antiquity. A series of interdisciplinary investigations have been carried out, including archaeozoological analyses combined with radiocarbon dating, and geoarchaeological research in order to better understand the nature and timing of Roman influence during the transformation processes of the Roman Empire. Significant factors that have been taken into consideration include cultural parameters, such as the survival of local (Iron Age) practices in livestock farming and exploitation, as well as the effectiveness of Romanisation in Pannonia. In addition, the environmental setting, local ecology, topography, availability of natural resources and accessibility played a decisive role. Our research suggests that the Late Roman faunal assemblages present a mixture of Iron Age and Roman elements, suggesting a relatively gradual process of transition between both periods.

## 11 ANIMAL HUSBANDRY IN TIMES OF CHANGE: THE ZOOARCHAEOLOGY OF COLOGNE (GERMANY) DURING THE EARLY MIDDLE AGES

**Abstract author(s):** Grau-Sologestoa, Idoia (University of Basel)

**Abstract format:** Oral

The Roman city of Colonia Claudia Ara Agrippinensium was founded in 50 AD by the river Rhine and, for centuries, it remained as one of the political and economic centres of the northernmost limes region. The Late Roman political crisis and the pressure from the Germanic tribes, presumably, had a deep effect on this city, but archaeologically, little is known about it.

In the context of a larger research project (ZooRoMed, MSCA-IF), the faunal remains recovered between 1996 and 1998 at the excavation of Heumarkt in Cologne (Germany) have been examined. Special attention has been paid to the taxonomic frequencies, the kill-off-patterns, and biometrical data of the main domesticates (cattle, sheep/goat and pig), in order to understand animal husbandry practices at the site, and to investigate possible changes derived from the socio-political upheavals that the city underwent in this period of crucial transformations. This large faunal assemblage was recovered in contexts dated between the 5th and the mid-10th century AD, therefore covering the Merovingian, Carolingian and Ottonian periods. The results of this analysis show substantial changes in animal husbandry practices during this long period of time, in line with other patterns discussed for other European regions, in relation to the development of medieval socio-economic structures.

a.

## ESTABLISHING A STRATEGY FOR THE EXPLOITATION OF DOMESTIC ANIMALS ON THE SITE JERININ GRAD-BRANGOVIĆ THROUGHOUT THE CENTURIES

**Abstract author(s):** Brancic, Anastasija (University of Belgrade, Faculty of Philosophy, Department of Archaeology)

**Abstract format:** Poster

The site of Jerinin grad – Brangović is located in the eastern part of today's Serbia, and is dated between the middle of the 3rd century AD and the 8th century AD. This Byzantine fortification was located near an important ancient road that allowed the communication of various areas with significant ore deposits, and its size and position indicate its importance. Thus, it represents a valid case-study for questioning potential changes in the economy between the Late Roman and the Early Medieval periods. Many years of research have produced a large number of finds, including faunal remains, which were analysed in 2012, 2013, 2014 and 2016 by the high-school participants of the Archaeology Program in Petnica SC, while being guided by trained archaeozoology professionals. This paper aims to provide an insight into whether the mode of animal exploitation of the site in question changed between the 3rd – 4th, and the 5th – 6th centuries. This will be accomplished by looking at species ratios from both phases, as well as creating mortality profiles for the four main domesticates, by using mandible and maxillary teeth eruption and wear, as well as the epiphyseal fusion of the long bones.

b.

## ANIMAL HUSBANDRY AND AGRICULTURE IN THE ROMAN-BYZANTINE SETTLEMENT OF IBIDA (SOUTH-EAST ROMANIA)

**Abstract author(s):** Cabat, Alexandra (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Danu, Mihaela (Faculty of Biology, Research Department, Alexandru Ioan Cuza University of Iași) - Stanc, Simina (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Bejenaru, Luminita (Faculty of Biology, Alexandru Ioan Cuza University of Iasi; Romanian Academy – Iași Branch, “Olga Necrasov” Center of Anthropological Research)

**Abstract format:** Poster

The Roman-Byzantine settlement of Ibida, with an area of 24 ha, is located in Slava Rusă, Tulcea County. Our study focuses on a site researched in 2014, named “Andrusca property”.

Ibida settlement has preserved archaeozoological and archaeobotanical remains (phytoliths) that allowed an evaluation of the human-environmental interactions during that period. Bringing together bioarchaeological data, this study contributes to understand the subsistence economy during a period of socio-political changes in this region. The stratigraphical sequences and the preliminary observations made on the archaeological materials indicate a relative chronology beginning with the 2nd-3rd centuries AD and lasting until the 6th century AD.

The inhabitants of Ibida relied on a subsistence economy mainly based on plant cultivation, animal husbandry, hunting and fishing.

The archaeozoological sample contains 956 remains belonging to fishes and mammals. Seven domestic mammal species were identified: cattle, sheep, goat, pig, horse, donkey and dog. The list of wild mammals includes red deer, wild boar, roe deer, hare, aurochs and fox.

The phytolith analysis highlights the clear domination of grasses (Poaceae) and indicates the presence of cereals within the fortress. In the surroundings of the fortress it appears to have existed an open environment. Although modest, the percentage of the SPHEROID phytoliths suggests the presence of woody dicots, indicating the fact that wooded surfaces existed near the fortress. The archaeozoological data confirm the fact that the fortress was placed in an open environment, where people bred especially cattle and sheep/goat flocks, and they hunted species such as hare; also, the forest existed nearby, as it indicated by the remains of red deer and wild boar. We identified also wild species living between forest and open field (roe deer, aurochs).

c.

## ANIMAL FOOD RESOURCES IN THE LATE ROMAN SETTLEMENT OF SACIDAVA (CONSTANȚA COUNTY, ROMANIA)

**Abstract author(s):** Stanc, Simina Margareta (Faculty of Biology, Alexandru Ioan Cuza University of Iași) - Mototolea, Constantin - Potârniche, Tiberiu (Museum of National History and Archaeology Constanța)

**Abstract format:** Poster

The fortress of Sacidava is located 5 km to the North-East of the village of Dunăreni, on the Danube bank (Constanța County, Romania). Sacidava is part of the military complex (limes), built along the Danube, starting from the first century AD, developed and maintained until the end of Antiquity (7th century AD).

The archaeological research carried out until 1979 revealed the existence of two gate towers (on the east and west sides). In 2014 a section S1 was researched and in 2019 the research continued by opening section S2, arranged parallel to S1, oriented in the North-South direction. During the archaeological research, nine complexes were identified: two late Roman dwellings, a pit used to produce concrete, a road segment which corresponds to the access axis from the East and part of the perimeter walls of a large building. All identified complexes are dated to the 6th century AD. This detail is confirmed by the discovery of two coins dating during the time of Justin II, recovered in the archaeological layer, as well as ceramic fragments.

During the archaeological research carried out in 2019, faunal remains were recovered. Archaeozoological quantification aimed at evaluating the relative frequencies of identified species in order to estimate the animal resources and subsistence practices (an-

imal husbandry, hunting, fishing). The methodology was specific to archaeozoology, mainly consisting of anatomical, taxonomical and taphonomical identifications, recording and quantification of the data. The remains of domestic mammals have the highest proportion indicating the importance of animal husbandry; the predominant species are Bos taurus, Ovis aries/Capra hircus and Sus domesticus. Fishing and hunting were of secondary importance in the subsistence economy of the community. Wild boar and the red deer were the most frequently hunted species. Just a few fish bones were recovered.

260 COPING WITH DEATH AT ALL AGES: (POST-)FUNERARY PRACTICES, MOURNING AND RESILIENCE

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Chub, Nataliia - Hofmann, Kerstin (RGK - Romano-Germanic Commission DAI) - Rebay-Salisbury, Katharina (Institute for Oriental and European Archaeology, Austrian Academy of Sciences)

**Format:** Regular session

In the past, the archeology of death has primarily focused on identities, social roles and statuses of the diseased individuals; less effort has been put into examining funerary practices in their emotional context, and exploring the mechanisms of coping with death.

Inspired by the concept of resilience, which has gained traction in environmental and socio-ecological archaeology, we approach death as a stressor to relatives and the communities of the survivors, who try to cope with the ambivalence of presence and absence of the dead. For this purpose, various resources are employed. In psychology, one speaks of resilience factors, but how can such abstract concepts as active coping, optimism, religiousness and social support be related to (post)funerary practices documented on burial grounds? How long should mourning, commemoration and taking care of the grave last? What does death look like from the perspective of a grieving parent or child?

Psychological and social responses to death appear to depend, to a large degree, on the age of the deceased and if death was expected. Deaths of foetuses, peri-nates and very old people may have invited different responses to persons who died unexpectedly in the prime of their lives.

We invite papers that interpret (post)funerary practices as coping strategies in the widest sense, and advance our understanding of resilience. On the individual level, these may concern dealing with the dead body and the things a person left behind, funerary practices, re-visiting and care of graves, as well as re-use of graves.

On the communal level, we aim to understand changes in belief systems about death and the afterlife as well as mortuary traditions, how funerary spaces are founded and abandoned, and explore the tension between leaving the dead in peace and continuous engagement with them.

ABSTRACTS

1 LIVING WITH DEATH. ARCHAEOLOGY OF DEATH AND RESILIENCE RESEARCH: BROTHERS IN ARMS?

**Abstract author(s):** Hofmann, Kerstin (RGK - Romano-Germanic Commission DAI)

**Abstract format:** Oral

Living with death is one of the central challenges faced by human beings. How they successfully cope with death and deal with the remains of the deceased are questions that have been of increasing interest in recent years. The ars moriendi appears to have phases of greater intensity, especially in times of uncertainty, for example with the appearance of new concepts of the person. But media and possibilities also play a role. If we regard the scholarly debate about death and mourning as a form of the ars moriendi, then what contribution can be made by looking at the materialised past, and by the archaeological analysis of burial grounds and of how bodies and final remains are dealt with? Can the archaeology of death and resilience research be brothers in arms when looking into the question of the good way of dealing with death? To what extent must we, in order to do this, further develop the questions, concepts and methods of the archaeology of death into those of a thantoarchaeology? What part can be played by a historicisation of the perception of death? What do we learn about our narratives of death when we work together with psychologist and sociologists in interdisciplinary projects? How can archaeological sources be used to analyse concepts as abstract as cognitive flexibility, self-effectacy, and social support? And do the former perhaps provide evidence of other factors or practices that lead to resilience? During the course of this paper, these questions will be the subject of systematic discussion, and possible perspectives from an interdisciplinary cooperation in the investigation of death and mourning identified.

2 RESILIENCE OR SUBVERSION? MORTUARY SPACE AND BURIAL OF YOUNG CHILDREN IN THE LATER MIDDLE AGES

**Abstract author(s):** Hausmair, Barbara (University of Innsbruck)

**Abstract format:** Oral

Across societies, deaths which take place in early infancy often trigger distinctive responses in burial practices, signifying the ambivalent social status of those who died before they really lived. In medieval archaeology, studies of infant burial have predominantly focused on identifying the baptismal status of the deceased and/or discussing the ambivalent social status of unbaptized children within medieval Christian society. This paper aims to shift the focus from the social status of unbaptized children to coping

mechanisms of families and subversive practices. Using burial data from later medieval Central Europe a broad variation of ‘illicit’ burial practices connected to early deceased infants will be presented. By integrating medieval burial regulations that denied unbaptized children a Christian funeral and beliefs concerning the structure of the afterlife, I will argue that such burial patterns may be understood as results of families’ coping strategies that drew on contemporary notions of sacred space embodied in the actual topography of the church(yard). Building on Henri Lefebvre’s spatial triad (espace perçu/conçu/vécu) and Edward Soja’s concept of thirdspace, I will show that on an individual or local level producing and altering burial space constituted a resilience factor for families. Yet, considering the frequency of such burial patterns across later medieval Europe, I will discuss whether such practices may be also understood more generally as subversion to ecclesiastic dominance. By creating a thirdspace in mortuary contexts lay communities actively contested prescribed rules and – unknowingly – may have contributed to wider aspirations that aimed to change eschatological as well as social orders, eventually erupting in the reformatory movements at the end of the medieval period.

3 CONSOLIDATING GROUP COHERENCE THROUGH STRUCTURING RITES, SYNCHRONIZED EMOTION AND SHARED COGNITION DURING THE IRON AND ROMAN AGE IN THE NETHERLANDS

**Abstract author(s):** de Roest, Karla (University of Groningen - Groningen Institute of Archaeology)

**Abstract format:** Oral

Coping strategies come to the forefront in times of crisis or uncertainty. When a death occurs, the social stability of a group is threatened by emotions such as grief, anxiety and anger. To structure these emotions and regain a stable group, rites and actions are performed. These rites are part of the group’s narrative that is distributed through shared cognition. The narrative, or collective memory, of the group assures that if proper steps are taken, all will go back to normal. Rites are thus aimed at cohesion, by channeling emotions; directing the group during stressful events. In turn, this channelling or synchronizing of emotions helps strengthening bonds. For instance, when a group’s arousal is synchronized through rhythmic group activities, such as chanting or dancing, but also e.g. fire-walking, its members experience an enhanced feeling of togetherness. Often, the collective memory, with it’s accompanying emotions, is deliberately activated, for example through the location of the activities or nearby grave monuments (lieu de mémoire).

My PhD-research on funerary activities during the Iron Age and Early Roman Age in the Netherlands (800 BCE - 200 CE) combines archaeological finds with theories from cognitive studies. It aims to demonstrate that the shared cognition of coping strategies is reflected in the execution of graves, in grave goods, the treatment(s) of bodies or body parts and the location and circumstances in which these were left. Individual factors such as age and provenance played a role, as evidenced by the practices surrounding children’s graves and graves from ‘foreigners’ (based on isotopic research). In order to re-establish social stability, rites were refitted to the specifics at hand: sometimes hybrid traditions seem to have been the answer and sometimes burials that truly deviated from local customs, when the circumstances did not fit the regulated narrative of the group.

4 BEYOND BURYING THE DEAD: HOW CERTAIN STRATEGIES WERE CHOSEN IN THE LATE SHANG KINGLY MORTUARY CEREMONIES

**Abstract author(s):** Mizoguchi, Koji (Kyushu University)

**Abstract format:** Oral

The study of the Late Shang royal cemetery of Xibeigang, Anyang Yinxu, China has been focusing on the reconstruction of the rules of royal succession and their descent/kinship-related/cosmological meanings. This paper adds a new perspective to this trend by reconstructing the strategies adopted in designing funerary ceremonies. By comparing the events and/or trends of the reigns of the successive Shang Kings—‘recorded’ in such classics as Shiji and the Bamboo Annals—with reconstructed strategies the author will reveal why a certain mortuary strategy was chosen. The selection and execution of certain mortuary strategies concerning how to position a newly dead king’s tomb in relation to certain extant tombs of the ancestral kings show significant correlations with the deeds of the respective kings and events in their reigns recorded in Shiji and the Bamboo Annals. It also leads to an intriguing thought; the deceased, i.e., the kings themselves, took charge of planning and designing one’s funereally process well before the death. Together with exclusive access to the system of writing—and effectively to the way of preserving memories—the kings and his factional allies manipulated the information they exclusively possessed and constructed their positions in the world view and attempted to legitimise their actually quite fragile power base and domination.

5 “THIS IS THE GIFT FOR THE DEAD”: GIFT-GIVING AND THE IMPORTANCE OF BURIAL RITES IN HOMERIC EPIC

**Abstract author(s):** Berndt, Ulrike (none)

**Abstract format:** Oral

Gift-giving is a concept deeply embedded into the fabric of society as described in Homeric Epic. Gifts are exchanged to commemorate and strengthen social bonds (e.g. of hospitality), but they also can be given to honour individual success and therefore serve as an indicator of social status.

The same language is used to describe the process of honouring the dead, although in this case, the gifts are not material - i.e. grave goods - but the conducting of proper burial rites and the construction of a burial mound that serves as a visible remainder of its inhabitants life. Together, they ensure that the memory of the deceased lives on in the form of kleos – the good reputation, fame



or glory of the deceased that is transported in songs and stories and therefore embedded in collective memory. Additionally, burial rites carry a religious connotation, since the soul cannot find entrance into the underworld without them and therefore would not find rest.

This paper explores how these notions ascribed to the burial serve as consolation for the grieving relatives and friends, but also in situations of immediate mortal danger, and compares and contrasts the descriptions of the burial process with the archaeological evidence of burial rites in Early Iron Age Greece.

## 6 WHEN IS A NEOLITHIC INDIVIDUAL DEAD? KEEPING THE DEAD CLOSE IN THE BALKAN (E)NEOLITHIC

**Abstract author(s):** Ion, Alexandra (Institute of Anthropology Francisc I. Rainer)

**Abstract format:** Oral

How did the Neolithic communities deal with the presence of death and the dead in their midst? Based on the archaeological traces left behind, they followed several strategies through which the relationship between the living and certain dead was maintained for long periods of time: (a) through the curation and deposition of body parts, (b) through the integration of bodies in mixed assemblages and (c) through grave reopenings. As Roger Ivar Lohmann (2005, 190) points out in his study of Oceanic practices: 'It is anthropologically useful to also define death in social terms as a point at which social interaction with the deceased becomes impossible, given prevailing cultural models of reality.' Following this framing, one could say that in the case of the Neolithic dead found in settlements throughout the Balkans, the dead are never fully dead, as social interactions with the living seem to continue over significant periods of time. The manipulation of certain dead bodies becomes a means through which the past can be referenced, thus creating an inter-generational dialogue. Through several examples I hope to show that at the same time bodies undergo multi-stage processing through which the dead gradually become 'completely dead'. In the process, the persona of the deceased was reconfigured, making possible its manipulation at the cross-roads of object and individual. As the organisers of this session state, in this way the living dealt 'with the ambivalence of presence and absence of the dead'.

Lohmann, R. I. 2005. The Afterlife of Asabano Corpses: Relationships with the Deceased in Papua New Guinea. *Ethnology* 44 (2): 189-206.

## 7 RESILIENCE IN THE FACE OF DEATH. HOW CAN WE KNOW THEY COULD COPE WITH BEREAVEMENT?

**Abstract author(s):** Chub, Nataliia (RGK - Romano-Germanic Commission DA1)

**Abstract format:** Oral

Sooner or later every person is confronted with death - that of a beloved one or their own. Although we cannot comprehend how a person experiences their own death, we can understand that the death of a loved one is a crisis that has to be coped with to ensure a continued ability to live and function normally. From a psychological perspective, the ability of individuals, groups of individuals or other entities to be resistant against various types of stressors and continue a successful functioning during and after the crisis, is called resilience. Different factors, so-called resilience factors, can contribute to the resilience of an entity.

But how can we as archaeologists be aware of whether prehistoric societies have developed a resilient dealing with death? Graves, as one of the main archaeological sources, evidence the confrontation of the burial community with death and loss. It can be assumed that one of the functions of burial practices, besides the removal of the body, is to support coping with death and loss through certain actions and routines. Yet can we conclude that funeral practices are linked to the resilience factors which are relevant for coping with death as a stressor? In this case, resilience factors could be deduced from archaeological record.

The approaches, methodology and problems of archaeological resilience research on the basis of funerary monuments will be demonstrated using Final Neolithic to Middle Bronze Age necropolises from the Lech Valley as a case study.

## 8 BORO, MY SISTER, DEAR TO ME. THE USE OF NAMES IN FUNERARY CONTEXTS IN ROMAN AND MIGRATION PERIOD NORWAY

**Abstract author(s):** Albris, Sofie Laurine (University of Bergen)

**Abstract format:** Oral

When runic inscriptions first appear in Scandinavia, they are mainly maker's marks found on objects. In Norway, runes soon also came into use in connection with death and burials. Whereas the later Viking Age commemorative rune stones are often formulaic, the early inscriptions are a hetero-generous group. Some are short, maybe only a name buried inside a mound or stone setting. Peculiarly, male names can be found in mounds with female burials. Other commemorations are placed in the open on rocks or stones, and may name both the deceased and the dedicator. Names are closely connected with personhood and represent both individual identity and kinship. This paper will discuss the use of written names in funerary contexts as individual and innovative ways of coping with grief and loss. Preserving the name of a loved one may be considered an action directed both towards an afterlife and commemoration for those left behind.

## 9 FUNERARY PRACTICES AND EPIDEMIC DISEASE: A DIACHRONIC ARCHAEOLOGICAL REVIEW OF PLAGUE GRAVES

**Abstract author(s):** Gutsmiel-Schumann, Doris (Freie Universität Berlin, Institut für Prähistorische Archäologie)

**Abstract format:** Oral

Diseases and infections were potential causes of death in the past. However, as infections often kill quite rapidly, it was not possible to see at skeletal remains out of excavated graves if an infection or disease was the cause for the death of an individual person. This was also the case for the plague, even though we knew from written texts especially from the late middle ages and early modern times that some graves and cemeteries were addressed as plague graves.

With new developments in paleogenetic methods and research, it is now possible to see through the presence of the aDNA of *Yersinia pestis*, the bacterium that causes the plague, if a person died because of a plague infection. aDNA-confirmed plague graves are known from early modern times and the middle ages, from where also written texts about the plague and plague outbreaks are known, but also from older times: So far, the earliest plague grave is dated to the late Neolithic/early Bronze Age.

But how did the contemporary society react to the death of its members because of a plague infection? By comparing the burial ritual that was applied at the funeral of the plague victim with the typical or normative way of burying the death in the contemporary society can give here some insights.

In my paper, I would like to discuss aDNA-confirmed plague graves from different times and regions from an archaeological perspective, to explore the reactions of different societies to a potentially epidemic disease.

The results of this survey shall then be contrasted to the modern expectations, how people in the past should have reacted to plague infections.

## 10 THE ROLE OF SYMBOLIC BURIALS IN THE CARPATHIAN BASIN AND LOWER DANUBE REGION DURING THE LATE NEOLITHIC AND COPPER AGE

**Abstract author(s):** Hegedus, Zsuzsa (Eötvös Loránd University, Institute of Archaeological Sciences)

**Abstract format:** Oral

It is widely accepted that the death of community members creates a critical situation amongst their peers, triggering the formation of various funerary practices. But how does the community cope with a death without material remains? What tools were used to achieve the state of social death, thus giving solace to both the community and to the dead themselves? And what other meanings can we grasp in the cases when it is apparent that a symbolic burial was not assigned to a person dying far from home?

In my presentation, I wish to show how the symbolic burials of the Carpathian Basin and Lower Danube region can be interpreted during the Late Neolithic and Copper Age. From grave pits containing a person's material mementos and giving focal point to grief, through the highly complex structures capable of forming and manipulating a group's collective memory, to features with rather metaphorical connections to "real" graves, the spectrum of interpretation is broad. All of this suggests that our traditional perceptions and ideas need to be re-evaluated. The colourful picture shown by the different types and aspects of symbolic burials reflects how people, through abstract thinking, created features most fitting to their needs. As the collected data comes from a wide geographical and time frame, the constant change and diversity are to be expected – but still, the thorough examination shows some global tendencies, might relating to universal aspects of human behaviour in connection with death. With a detailed analysis focusing on symbolic burials, precious information can be collected on the complexity of funerary practices dating back thousands of years.

## 11 THE FUNERAL RITE AT THE LBA-EIA CEMETRIES IN THE SOUTH-EASTERN POLAND AS A SEQUENCE OF ENCODED, CULTURAL AND RITUAL ACTIVITIES

**Abstract author(s):** Korczynska, Marta - Moskal-del Hoyo, Magdalena (W. Szafer Institute of Botany, Polish Academy of Sciences) - Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

**Abstract format:** Oral

Starting point of the presentation is the study of the Late Bronze Age - Early Iron Age urnfield cemetery in Janowice, site 44 (Western Carpathians), which relies on the diachronic analysis of intra-site grave inventories, anthropological research, and analysis of charcoal remains of funeral pyres. Hence, some clear regularities, such as canonical inventory sets, standardized fragmentation of the bones, correlation between urn size and age in the early phase of the cemetery, or type of wood used to build a pyre remained resilient for longer period of time. All these features should be interpreted as a unique, regional, ritual fingerprint of the community, while their variation, such as placement of bronze objects in the urns of some women and small children or uncanonical inventories, might be caused by various factors within social order and ritual norms and might represent the biographical fingerprint of the buried person. In the following study it is assumed that the aim of funeral ritual ceremonies was, on the one hand, to support the social transition of the dead person into an ancestor, and, on the other, to provide a space for communication and social acts. In addition, as a community living in the Janowice microregion was obviously a part of a complex network system, some burial customs reconstructed at Janowice cemetery have been traced and contextualized at the contemporary cemeteries in adjacent areas. As a result, an attempt was made to assign back the material culture of those case study funeral sites to its sacral context according to conceptualization of rites of passage by Arnold van Gennep.

BURNING BODIES. POST-CREMATATION ACTIONS AND OTHER RITUAL PRACTICES AS A WORK OF MOURNING

**Abstract author(s):** Gramsch, Alexander (RGK - Romano-Germanic Commission DAI)

**Abstract format:** Oral

In this paper I want to regard the ritual actions during and after cremation as a way of coping with death, focusing on the body, but including post-funeral actions. In previous research I have analysed Late Bronze Age and Early Iron Age cremation practices as communicative practices designed to communicate and transform social identities and social relations. From this social approach I want to expand to include the emotional aspects and explore how the fire-based transformation of the body of the deceased can be a way of active coping with loss and mourning. I want to answer the question if and how we can access grief work, active coping or resilience in prehistoric societies by reconstructing the sequence of gestures, actions and practices that make the burial ritual. Issues will be the definition of ritual, the ritualised transformation of the physical remains of an individual as resilience factor, and the structuring of the ritual sequence. Since the work of mourning requires time while the decay of the body causes time pressure, particular attention will be paid to the temporality of the ritual sequence.

THE RESTLESS DEAD OR THE RESTLESS LIVING? POST-DEPOSITIONAL PRACTICES IN GALLERY GRAVES OF LATE NEOLITHIC WESTERN GERMANY

**Abstract author(s):** Pape, Eleonore (Georg-August-Universität Göttingen)

**Abstract format:** Oral

The second half of the 4th millennium BC in Europe is marked by two conspicuous and partially parallel phenomena: the frequent construction and use of megalithic burial structures, and the frequent practice of collective burials. It is in the framework of these phenomena that the so-called gallery graves arise in a few regions of Central and Western Europe, geographically separate and with distinct material cultures.

The rectangular, bipartite, subterraneous and mainly megalithic structures were repeatedly accessed and maintained for several centuries. The chambers could contain up to several hundred individuals, the remains of which were all to some degree manipulated by the living, subsequently to their primary deposition. The presence and the active involvement of the living, however, are visible only through the combined and meticulous examination of the grave contents and structures, in both their vertical and horizontal dimensions.

Based on selected gallery-grave studies of Western Germany, this paper will focus on the presence of the living at and within such burial structures and on their repeated engagement with their past, deceased community.

THE WORK OF THE LIVING: TOMB REUSE IN PRE-ROMAN APULIA AS STRATEGY OF REMEMBERING AND FORGETTING

**Abstract author(s):** Hoernes, Matthias (University of Innsbruck)

**Abstract format:** Oral

In the archaeology of death and burial, tomb reuse is often either reduced to a mnemonic attachment to the past or to social amnesia after commemoration has expired and the ‘older dead’ have fallen into oblivion. Both interpretations tend to conceptualize graves as static entities and as mere reflections of social dynamics, rather than as agentive factors for social life. Drawing on case studies from pre-Roman Apulia, where many tombs were repeatedly reopened and reused, the paper acts on the assumption that tomb reuse was a highly complex procedure that forced communities into performing funerary practices for the recently deceased and, at the same time, negotiating the way in which bodies and objects of ‘older’ dead were manipulated. In southern Italy, the treatment of the remains of previous depositions ranged from internal reduction to external secondary deposition to complete removal from the funerary context, and in terms of the material body, from preserving its integrity to effectuating its disintegration. Rather than providing a source that instilled a fixed identity for the deceased in the minds of the survivors, sets of grave goods were added or supplemented, previously deposited objects were selectively incorporated within later ensembles, and older items followed the remains and stayed with them, were disassociated from them and re-deposited both inside or outside the grave, or completely removed to be replaced by new ones. It is argued that post-funeral practices, as ways of acting on and engaging with the materiality of the dead, constituted viable strategies for both maintaining a prolonged relationship with the deceased and mediating an active process of selective remembering and active forgetting that allowed for the social resilience of groups and communities.

RE-USING OLD GRAVES AS A STRATEGY OF RESILIENCE? SOME CONSIDERATIONS FROM AN ETRUSCAN PERSPECTIVE

**Abstract author(s):** Pasieka, Paul (Johannes Gutenberg-Universität Mainz; Technische Universität Darmstadt)

**Abstract format:** Oral

The practice of transferring older burials to new family graves, especially (the burials) of the parent generation of the grave founders, has been known for a long time in Etruscan funerary archaeology, although it has not yet been treated systematically. However, another practice has remained largely unnoticed, namely the re-use of older tombs: Tombs that have not been used for several generations, are re-visited and used anew for funerals. However, this re-use of graves is very rare in Etruria (central Italy). It occurred both

in a limited time span (during the 4th and 3rd century BC and in the 1st centuries BC / AD), and in a limited spatial area (in the regions Cortona, Perugia, Volterra, Tuscania, Cerveteri). Furthermore, this practice is most commonly often, but not exclusively, related to outstanding, individual tombs.

In my paper, I'd like to present a first summary of this practice of re-use of older tombs in Etruria, and associated practices known from the archaeological record. I will then place it in the wider context of memory, memorial cultures, and ways of coping with loss and death in Hellenistic and Imperial Etruria. A number of questions and aspects shall be given particular consideration, e.g.: How were the older burials dealt with? What roles did grave care and the memory of the deceased play, and why does the practice of re-use appear only at specific periods? Could the association with older graves, and thus with the past, have contributed to strengthen both individual and collective resilience, for instance in the face of loss but also of social change in general? Another central question is the relationship between newly buried and the old grave-owners, and in particular whether they belonged to the same family or kinship group.

BETWEEN PAGAN AND CHRISTIAN: THE REUSE OF OLD BARROWS IN LATE MEDIEVAL – EARLY MODERN PERIOD LITHUANIA

**Abstract author(s):** Kurila, Laurynas (Lithuanian Institute of History)

**Abstract format:** Oral

In the context of the cemeteries from Lithuania’s Late Medieval – Early Modern period (late 14th–18th centuries), graves dug into Roman period – Viking age barrows can be distinguished as an odd burial type. The “return” to the barrow cemeteries occurred centuries after they had been abandoned and the barrow tradition had ceased. In the 16th–17th centuries, burial in ancient barrows assumed a mass scale, and some barrow cemeteries gradually became completely occupied by rural cemeteries. However, these burials do not differ from the rest in terms of their construction, Western orientation, and the general trend of decrease in quantities of grave goods.

Referring to the written sources and mapping of the discussed cemeteries and the Catholic and Evangelical churches, the presentation will suggest that the reason of this specific comeback in burial rite is the model of Lithuania’s Christianisation. The Grand Duchy of Lithuania was baptised as late as 1387. Up until the 16th century, the network of churches was sparse and the lack of priests and of the spread of Christianity in the local tongue was critical. Burial in churchyards and the use of Christian rites had not become entrenched. Along with other pagan relics, ecclesiastical written sources condemn burial “in fields and forests”. On the other hand, during the Reformation and especially the Counter-Reformation, the compressed parish network and the increased pressure from the Church to observe Christian burial rites and pay the exorbitant fees for them could have provoked the population’s hostility. This forced the people to look for more remote locations for cemeteries, locations some communities found in old pagan barrows of which they had maintained or created the memory as the places of rest of their ancestors. This also reflects people’s confusion against a background of the religious discord, and the frequent conversions.

WOOD WITHOUT KNOTS? THE CUSTOMS ASSOCIATED WITH THE PREPARATION OF COFFINS IN POLAND

**Abstract author(s):** Majorek, Magdalena (University of Lodz, Institute of Archaeology (Poland))

**Abstract format:** Oral

For centuries, human death has been an event in which a social group participates, and therefore has social significance and consequences. We can distinguish two dominant principles of a funeral rite:

- obligation to free the social group from the body of the deceased,
- adapting the whole group to the new situation by appropriate conduct during funeral preparations, during the rite and during mourning.

The basis for considering Polish Christian funeral practices in the Middle Ages and modern times are archaeological, historical, ethnographic and art history sources. Based on information from these sources, it is also important that:

- who was preparing the coffin (a neighbor or a qualified carpenter?);
- what was the casket made of (what wood? with or without knots?);
- what did the coffin look like (what technique was used? how was it decorated? did the boards have knots? was there a window in the lid?);
- what did the coffin manufacturer leave inside?;
- how was the deceased transported in the coffin (how was the house threshold crossed? how was the coffin placed in the church?).

During my presentation I will answer these and many other questions that arose during my research on coffins. I will try to explain why this was done. I will also discuss the basic functions of coffins.

So we will consider how death looked from the perspective of a person looking at the deceased assembled in a specific, unique coffin.

a. „DEATH DO US PART” – FUNERARY PRACTICES IN THE LATE IRON AGE CEMETERY OF NOVAJIDRÁNY – SÁRVÁR-ERDÉSZHÁZ (HUNGARY)

**Abstract author(s):** Sörös, Franciska - Vass, Bíborka (Hungarian National Museum / Magyar Nemzeti Múzeum)

**Abstract format:** Poster

The archaeology of death has been in the focus of archaeological research for many decades. Studying death in its social context leads to new understandings of the way people and communities in archaeological ages dealt with grief and loss.

In April 2019 the Hungarian National Museum Archaeological Heritage Protection Directorate excavated the biritual cemetery of No-vajdrány – Sárvár-Erdésház (Northeast Hungary). During the processing of the Late Iron Age graves, we faced the methodological problem of identifying the mortuary practices without traces of grave pits. Our interpretation can be based solely on the skeletal remains and the accompanying finds.

We seek to answer questions such as how did Late Iron Age people cope with death? Based on the rites and funerary inventories can we see any differences in social responses to death? Do inhumation or cremation and cremated remains allow us to reconstruct parts of the funeral process? If so what do they tell us about methods the living chose to cope with death? Besides the well-re-searched topic of bending weapons as an important feature of the funeral practices, traces on ceramics and skeletal remains and their relations can also complete our understanding of how the living prepared for the event of the funeral.

Late Iron Age mortuary practices in the Carpathian Basin appear to tell a great deal us about the (then) living. These communities had to find their ways to adapt to change and deal with stress caused by the passing of relatives, members of the community. Death in-terpreted as a rite de passage and the (post)funeral practices viewed as helping the community move on and process the emotions surrounding death can contribute to a better understanding of Iron Age mortuary practices.

261 ARCHAEOLOGY OF CENTRAL PLACES IN EUROPE: POWER, CHRISTIANITY AND FUNERAL RITUALS

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Tiplic, Ioan Marian (“Lucian Blaga” University of Sibiu) - Fabijanić, Tomislav (University of Zadar) - Robak, Zbigniew (Institute of Archaeology, Slovak Academy of Sciences)

**Format:** Regular session

Central places played an important role in Early Middle Ages from political, religious, economical and social point of view. The theme is not a new one, but in the last 20 years the subject has been developing and a large amount of information has been provided by the archaeological research. It will be interesting to have an overview of the state of the art of archaeological research in Central and South East Europe related to places such Pohansko, Mikulcice (Czech Republic), Gars-Thunau (Austria), Nitra, Bojna (Slovakia), Zalavar, Szekesfehervar, (Hungary), Dabaca, Cluj-Mănăştur, Alba Iulia (România), Pliska, Veliko Tarnovo (Bulgaria) i.e., and not just to them. The archaeology of central places has provided us very interesting information regarding Christianization of the funeral rituals and the spread of the Christianity among the populations from the Eastern part of Europe.

Our scope is to put together specialists from all over Europe and debate topics such as:

- What means a central place in the early middle ages?
- Did Christianization play any role in the development of such central places?
- Can the Christianization of funeral rituals, in Central Europe, be linked with the missions of Cyril and Methodius?
- When can we talk about the first apparition of churches, in urban or rural area?

ABSTRACTS

1 IN THE SHADE OF POST ROMAN TOWNS: THE RISE OF LOCAL EITES IN NORTHERN DALMATIA (CROATIA)

**Abstract author(s):** Fabijanic, Tomislav (University of Zadar)

**Abstract format:** Oral

In early middle ages, the territory of present-day northern Dalmatia was divided between two political entities: Byzantine empire represented by the towns on the coast of the Adriatic sea, and emerging Slavic/Croatian entity in the hinterland. The contribution will mainly focus on the wider territory of Zadar, the center of Byzantine power in Dalmatia. In its hinterland there are numerous archaeological sites from Roman and post Roman era e. g. Roman municipium of Varvaria (today: Bribir) which was an important Liburnian, Roman and post Roman settlement situated on extremely important traffic route between the continent and the coast. “In the shade” of Bribir there are numerous early Medieval cemeteries some of which show the emergence of new medieaval elites e.g. the cemetery in Vačani near Skradin that was discovered by accident in 2010. Graves in Vačane contain finds typical for the 8th-9th century period (e. g. ceramic vessels). Most significant are burials in two late-Antique sarcophagi. In one of them two iron spurs were found. The other sarcophagus (Grave 10) contained remains of two male adults, early Carolingian sword (K-type), a pair of bronze spurs, solidus of Constantine V and a glass bottle (probably of Middle Eastern origin) as well as some other minor finds. The type of burial used for grave 10 and grave finds indicate socially privileged individuals with possible military background. Northern Dalmatia is also the territory that contains numerous early-Christian and medieval churches with adjacent cemeteries which can

incite numerous questions about continuity vs. discontinuity in those turbulent times.

2 THE SHIFT BETWEEN PAGAN AND CHRISTIAN FUNERAL RITUAL IN EARLY MEDIEVAL TRANSYLVANIA (9TH TO 12TH CENTURY AD)

**Abstract author(s):** Tiplic, Ioan Marian (Lucian Blaga University of Sibiu)

**Abstract format:** Oral

In early middle ages, the territory of present-day Transylvania was disputed by Bulgarian Tzarat, Byzantine Empire and later Hungarian principality. This paper will mainly focus on the rise of the new elites in 10th century AD and the spread of the Christianity among the population. The exponent of the new elites in that period are the central places developed in Alba Iulia, Cluj-Mănăştur, Dăbâca și Moigrad-Porolissum, fortified settlements located on former Roman towns. All these are known for the early Medieval cemeteries some of which emphasize the emergence of the hew religion - Christianity - starting with 10th century AD.

The analysis of burial grounds located inside the Carpathian basin during the 10th century reveals the weak Christianity’s emer-gence within the population. This was emphasized by the “pagan” funeral rituals. The food offering inside ceramic vessels represent-ed a commune practice within these pagan believes. The food offering is documented during the centuries prior to the 10th one.

All these centers contains early medieval churches with adjacent cemeteries which shows the shift between pagan and christian funeral rite starting with the first half of 10th century A.D.

3 CENTRAL PLACES IN THE EARLY MEDIEVAL CARNIOLA?

**Abstract author(s):** Karo, Špela (Zavod za varstvo kulturne dediščine Slovenije; Narodni muzej Slovenije)

**Abstract format:** Oral

The early medieval Carniola, Sclavorum patria (the homeland of the Slavs), as mentioned by Paul the Deacon in his Historia Lagobar-dorum extended along the Upper Sava Valley in the north-western part of the present-day Slovenia. Despite the written sources being scarce for this territory the reliable and authentic Annales regni Francorum mention Carniolenses, the inhabitants of Carniola. It is evident from these two historical sources that people who lived along the upper Sava river were Carniolans, a Slavic tribe (gens) politically incorporated in the March of Friuli under Frankish dominion at the latest around 800.

However, a political and organisational structure of Carniola and its central places remain unclear. Historically, the main centre of the region was Carnium, the modern Kranj. Its significance in the early medieval period is reflected in the size of the settlement and in the large cemeteries with burials from the 8th to the early 11th century, though the numerous graves yielded hardly any objects that can be associated with the Carniolan elites. On the other hand, exquisite items, such as pieces of weapons, military and horse equipment, skilfully wrought from quality iron and precisely ornamented, have been discovered at Gradišče above Bašelj, a hilltop site roughly 10 km north of Carnium. The visibility analyses revealed a clear visual connection between the two of them, which might be more than a coincidence.

4 STONE FORTIFICATION AROUND THE 11TH-CENTURY SZÉKESFEHÉRVÁR: RESULTS OF AN INTERDISCIPLINARY RESEARCH

**Abstract author(s):** Szűcsi, Frigyes - Szöllősy, Csilla (King St. Stephen Museum) - Morgós, András (Consart) - Horváth, Emil (In-dependent researcher) - Kern, Zoltán (Institute for Geological and Geochemical Research, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences) - Grynaeus, András (Hungarian Dendrochronological Laboratory) - Pető, Ákos (Szent István University, Faculty of Agricultural and Environmental Sciences, Department of Nature Conservation and Landscape Ecology) - Csoltkó, Emese (Hungarian National Museum, Archaeological Heritage Protection Directorate)

**Abstract format:** Oral

The stone wall around Székesfehérvár could already be built in the 11th century based on the latest archaeological and scientific results. Before these results the archaeologists usually supposed that the stone-built town wall researched in many parts of the city was made in the 13th century. This stone-built fortification encircled approximately 17 hectare large area, so it is not identical with the royal castle (castle of the Comes) covering 0.8–1.2 hectare on the highest point of the area.

Thanks to the excavations lead by Csilla Szöllősy, Frigyes Szűcsi and Emese Csoltkó in 14 Jókai Street during 2017 and 2019, the exact structure of the foundation of the stone wall was revealed, built up from wood, earth and stone. This type of foundation was necessary because the construction area was swampy. We also determined the structure of the lower part of the earth embank-ment behind the wall. Two independent dendrochronological research projects using different oak reference chronologies reached the same result for the wooden beams and boards used in the foundation (performed by András Morgós – Emil Horváth and András Grynaeus). Radiocarbon analyses of 5 samples were determined by the EnvironMICADAS 14C facility in the Hertelendi Laboratory of Environmental Studies, Debrecen, Hungary. The so-called wiggle-matching technique was employed in the calibration of radiocarbon results obtained from dendrochronologically cross-dated tree-ring sequences (performed by Zoltán Kern). The 11th-century den-drochronological and radiocarbon dating of the wood used in the foundation coincides with the Early Arpadian Age dated by ceramics excavated from the foundation structure. Our knowledge of the foundation structure could be complemented by the results of geoarchaeological investigations (Ákos Pető).

We summarize the results of interdisciplinary research, which shed new light on the role of Székesfehérvár as a center of power in



	the Early Arpadian Era.
5	<p><b>DEVELOPMENT OF EARLY CHRISTIAN ARCHITECTURE: KOSOVO CASE</b></p> <p><b>Abstract author(s):</b> Hoxha, Zana (Institute of Albanology) - Luci, Kemajl (Museum of Kosovo)</p> <p><b>Abstract format:</b> Oral</p> <p>This paper focuses on Early Christian architecture in the territory of Kosovo. Kosovo lies on the southeastern part of Europe, precisely on the Balkan Peninsula, putting the country at a favorable geographic and geopolitical position. Consequently, the process of Christianization reached this region relatively early. The written sources confirm that the earliest traces of Christianity are the first martyrdoms, Florus and Laurus, in the roman city of Ulpiana in the 2nd century AD, while the first traces in architecture from Ulpiana date from the 4th century AD. Through analysis of historical data and other available documents and archeological mapping forty six buildings of this type have been identified. The objective of this poster is to analyze and present through geographic information system (GIS) early Christian architecture, creating various maps based on location, date, type, typology, level of research, and legal status. These analyses will serve to create a clear picture of this type of architecture, and through that to better understand the appearance of Christianity in this territory. Moreover, using the spatial presentation we give us a clear picture of the differentiation between rural and urban areas.</p>
a.	<p><b>FUNERARY RITUALS IN DOBRUDJA (ROMANIA) IN THE 10TH - 11TH CENTURIES AD</b></p> <p><b>Abstract author(s):</b> Radu, Petcu - Petcu-Levei, Ingrid (Museum of National History and Archeology from Constanta)</p> <p><b>Abstract format:</b> Poster</p> <p>This paper aims to discuss the issues related to the funerary rites and rituals in the context of archaeological discoveries in Dobrudja, Romania. The subject try to approach the problems of the funeral discoveries throughout the 10th -11th centuries AD. The territory, from the point of view of the historical and archaeological researches, is favored by the passage of the Danube river, which was an important factor for the settlement of different populations, and has always had the favorable advantage of delimiting the funeral rite and ritual. In an extent overview, its revealed as an interethnic puzzle between the interlocking local populations which forms an integer, combining customs and traditions. The influence taken can be easily noticed, so the study of burial practices can give us important clues about the local populations that were in permanent contact with the migrants of the northern Pontic steppes, as well as about their Christianization and the joining and transition from the pagan to Christian funeral ritual.</p>
262	<p><b>MODERN NETWORKS AND PAST NARRATIVES: ‘TREASURE HUNTING’, THE ART MARKET, SCIENTIFIC ANALYSIS, AND CO-OPERATION FOR PROTECTION OF ARCHAEOLOGICAL HERITAGE</b></p> <p><b>Theme:</b> 1. Networks, networking, communication: archaeology of interactions</p> <p><b>Organisers:</b> Mödlinger, Marianne (University of Genoa) - Kairiss, Andris (Riga Technical University) - Godfrey, Evelyne (Uffington Heritage Watch) - Traviglia, Arianna (Italian Institute of Technology)</p> <p><b>Format:</b> Regular session</p> <p>The global art market includes antiquities that come not just from old collections but also recent ‘treasure hunting’. The art market benefits from well-established, effective networks from the ground up, and involves not just renowned auction houses, but also thousands of on-line forums and Social Media groups. Archaeology lacks similar coherent networks. Network-building initiatives, such as NETCHER, are rare. The first line of action must be the archaeologists, conservators, and scientists studying the artefacts. Better co-operation is needed between heritage professionals and police forces, customs, and other State agencies.</p> <p>In this session, we will discuss examples of:</p> <ul style="list-style-type: none"> <li>▪ Effective modern networking and co-operation to protect archaeological heritage, and solutions for combating illegal acquisition and trade in antiquities</li> <li>▪ Analysis, including investigative conservation, that helps to inform the archaeological narrative of artefacts.</li> </ul> <p>Case-studies might include artefacts that have been evaluated for or sold on the art market, or be from a site identified by ‘treasure hunters’, like the recently published Early Medieval Staffordshire Hoard, or be from a museum collection, or perhaps, like the Roman-era Sevso silver hoard now on display in the Hungarian National Museum, be the subject of repatriation after clandestine excavation and selling abroad. The justification for analysis in any case-study should be to inform the archaeological narrative and advance understanding of the historical context, such as analytical work to define the technology and examine the craftsmanship of the objects.</p> <p>Paper or poster submissions can address questions of:</p> <ul style="list-style-type: none"> <li>▪ Co-operation between agencies and institutions: how can we provide access to archaeological ‘grey literature’ and how can we connect different databases?</li> <li>▪ Ethical issues: for whom and why are we analysing objects?</li> <li>▪ Social and economic impact: contribution of outreach and community archaeology to inform the public of the damage of looting, and to engage people in ‘citizen science’.</li> </ul>

ABSTRACTS

1	<p><b>LICENCE TO LOOT? THE CHALLENGES OF A COOPERATIVE APPROACH METAL-DETECTING IN EUROPE</b></p> <p><b>Abstract author(s):</b> Deckers, Pieterjan (Centre for Urban Network Evolutions - UrbNet, Aarhus University) - Lewis, Michael (Portable Antiquities Scheme, British Museum)</p> <p><b>Abstract format:</b> Oral</p> <p>‘Treasure hunting’ (mostly through metal-detecting) is a widespread phenomenon practiced across Europe. To a greater or lesser extent this is regardless of legislative context, though policy and culture strongly affect the journeys that such finds follow. Many end up in private collections – the finders’, or after being traded on. Others, like the Staffordshire Hoard enter into museum collections, where they can be enjoyed by the public and studied by researchers; again, the pathways to this outcome vary. Another trajectory to take into consideration is how information about these finds is recorded, made accessible, and stored for posterity.</p> <p>This paper will examine the journeys of a number of recent detector finds from countries that take a cooperative approach to non-professional metal-detecting. We will highlight how this, combined with the right (digital) tools and an effective collaboration between various stakeholders, can lead to new knowledge about the past, support heritage managers in protecting the archaeological record, and foster stewardship amongst the wider public.</p> <p>Far from arguing for a one-size-fits-all approach, we will also discuss the challenges related to this approach, not least the political and cultural environments that determine its success. Overall, we advocate stepping away from ideological viewpoints to find a facts-based approach, balancing the costs and benefits of legislation and policy in a given context, in order to bring dividends to all interested in the past.</p>
2	<p><b>DESTROYING THEIR CULTURE TO PROTECT OUR PRECIOUSSSSSS? ‘TREASURE HUNTING’ AS INTANGIBLE HERITAGE</b></p> <p><b>Abstract author(s):</b> Karl, Raimund (Bangor University)</p> <p><b>Abstract format:</b> Oral</p> <p>Art. 27 (1) of the UDHR stipulates that ‘everyone has the right freely to participate in the cultural life of the community’. In its Art. 2 (1), the UNESCO Convention for its safeguarding defines the ‘Intangible Cultural Heritage’ as ‘the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage’. It imagines it as being ‘transmitted from generation to generation’, as constantly being ‘recreated by communities and groups’, and as providing them ‘with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity’.</p> <p>But to whose culture and practices (etc.) do these beautiful words apply to? Literally to everyone’s, as the UDHR demands? Or only to some, to those who are more equal than others, whose culture is superior to those of some others?</p> <p>‘Treasure hunting’ is a cultural practice, which - by far - predates the practice of archaeology. It has its own representations, expressions, and requires particular knowledge and skills. It has iconic instruments, produces objects and artefacts, and there are cultural spaces associated with it. There certainly are individuals and groups, and arguably even communities, who recognise it as part of their cultural heritage, transmit it from generation to generation and constantly recreate it, providing them with a sense of identity and continuity. In short: it is intangible heritage. It even is engagement with the past, which leaves material traces, which can be examined archaeologically, improving our understanding of past and present human cultural diversity.</p> <p>Do we, who profess to protect heritage ‘for everyone’, need to respect their culture and safeguard their practices, too? Or are we entitled to try to destroy it to protect our precious archaeology?</p>
3	<p><b>DAMAGES TO ARCHAEOLOGICAL HERITAGE RESULTING FROM UNAUTHORIZED EXCAVATIONS: SOCIO-ECONOMIC CONSEQUENCES AND LEGAL ASPECTS</b></p> <p><b>Abstract author(s):</b> Kairiss, Andris (Riga Technical University) - Olevska, Irina (ArtLaw.club)</p> <p><b>Abstract format:</b> Oral</p> <p>It is widely acknowledged that the destruction of archaeological sites, illegal removal and trade in antiquities leads to the impoverishment of the archaeological heritage, causing not only damage from the cultural heritage conservation and exploration perspective, but also a range of socio-economic losses.</p> <p>Considering social, cultural significance and multiple uses of the heritage, it is difficult to make an accurate monetary valuation of it even at the local level. There is also a view that heritage objects are priceless from cultural and historical perspective. If so, what are the criteria for assessing damage to archaeological heritage caused by unauthorized/illegal activities and how justified is calculation of such damage in the relevant civil, administrative and criminal proceedings? From an economic perspective, archaeological heritage has an asset value, so it is important to know its actual and potential socio-economic impact and the range of social interests involved in its use to justify and ensure its effective protection, maintenance and sustainable use. The basic solution for defining the value criteria of the heritage and assessing the damage to it seems to be related to identification of the spectrum of socio-economic interests in its use (“consumption”).</p>

Within the context of development and well-being of society, exploitation of archaeological heritage is closely linked to cultural, social, economic and environmental dimensions of sustainable development. Therefore, there is a growing debate about development of an interdisciplinary approach both to identifying and developing the opportunities presented by this heritage, and to identifying and mitigating its threats. Thus, by analyzing the situation in Latvia and other countries and based on the findings of archaeological science, integrated socio-economic and legal approach will be utilized in the presentation, providing both theoretical and practical insights into the challenges and possible solutions for assessing the damage to archaeological heritage caused by unauthorized activities.

4 FROM THE GATHERING OF MUSHROOMS AND BLACKBERRIES... TOWARD AN ARCHAEOLOGICAL NARRATIVE OF A BRONZE DEPOSIT IN EASTERN ROMANIA

**Abstract author(s):** Bolohan, Neculai (Alexandru Ioan Cuza University of Iași) - Gafincu, Alexandru Marian (Complexul Muzeal Județean Neamț)

**Abstract format:** Oral

The activity of the Romanian treasure hunters has become the weekend routine for a bunch of "amateur archaeologists". Recently, the spectacular growth of interest in unearthing ancient metal objects was boosted by a huge monetary breakthrough in southern Romania, in 2013. The discoverer was rewarded by a prime minister and then the boom followed. As metal discoveries multiply, the need to build the story behind these discoveries dramatically decreases.

In what follows I will present some case studies regarding the hunt for metal treasures and the manner in which these findings can be recovered and integrated into local historical narratives or into grand narratives specific for historical periods.

This activity implies, in the absence of coherent legal provisions, the development of special skills of interaction with the discoverer, with the institutions that have the purpose of preserving the heritage and with the guild of archaeologists or colleagues specialized in metal analysis.

The final activity will involve the scientific valorization and public involvement. About how we will manage to work together to meet the challenges of institutional cooperation, multiple ethical issues and the social and economic impact, the responses will be modeled by grafting the local specific on regional realities. If we do not succeed we will return to gather mushrooms, blackberries and metal scraps!

5 COLLECTION-DRIVEN EXPLOITATION OF THE ARCHAEOLOGICAL RECORD: WHO IS NETWORKING WITH WHOM AND WHY?

**Abstract author(s):** Godfrey, Evelynne (Uffington Heritage Watch) - Barford, Paul (Independent Researcher, Warsaw)

**Abstract format:** Oral

The explosive growth in recent decades of the collecting of 'portable antiquities' and the antiquities trade have led to substantial damage being done by artefact hunters to the archaeological record all over the world. Archaeologists were unanimous in raising concerns from the 1950s, and this led to legislative changes in some countries as a response. By the late 1990s, the problem was widely perceived as having reached crisis proportions. Yet at the same time, new attitudes towards archaeological collecting were beginning to emerge, in the archaeologies of the English-speaking world in particular. Some archaeologists saw artefact hunters as allies, with 'common interests' with archaeology. But above all, they discovered new and interesting objects for study. As a result, archaeologists in several countries are now collaborating with „responsible" individuals engaged in their collection-driven exploitation of the archaeological record primarily in order to gain access to many decontextualised artefacts. As a result of their constant and uncritical praise of artefact hunting and the alleged benefits it has brought to the discipline they are unwittingly involved in promotion of the hobby. These supporters of collectors dismiss offhand, sometimes in a hostile manner, the concerns and questions raised by those urging that archaeologists should be collaborating with each other in the protection of the archaeological resource from this kind of unsustainable exploitation. This paper will attempt to consider why these differences have emerged within parts of the archaeological community. This seems to be based on fundamental differences in conceptualising the nature, aims and responsibilities of the discipline.

6 THE ANTIQUITIES MARKET ON EBAY.COM: THE CASE OF ROMAN ANTIQUITIES AND THE UN-EXISTING PROVENANCE

**Abstract author(s):** Giovanelli, Riccardo (Università Ca' Foscari Venezia)

**Abstract format:** Oral

What's the shape of the antiquities market with the birth of Internet 2.0? Is it, as the prevailing narrative would like to say, an elite market? Or has the power of the "touch to pay" technologies and e-markets also changed such a showcase that has been always thought as an elite hobby? With my paper, I analysed the features of the antiquities market as it is on eBay: where the sellers are from? What they highlight within their advertising pages? What does it matter for the antiquities electronic market world? I then focused more in deep on the shape of the highest value Roman antiquities market on the same platform, in particular reflecting on the value of the "Provenance" issue, as witnessed by sellers, buyers and the platform itself.

Data collected in 2017 and 2019 show clearly that the majority of listings on the platform doesn't declare any Provenance at all and

that when existing, it's often unverifiable and of poor quality, but anyway legalised within a market whose rules are easy to overcome and played with. The high-end fraction of the market resulted as similar to the traditional art market plaza, but in eBay it is more possible that looted items can easily be put on sale and easily virtually moved from a place to another, consolidating the narrative of a "laundered" item.

7 INVESTIGATING THE PROVENANCE OF EGYPTIAN BLUE PIGMENTS IN ANCIENT ROMAN POLYCHROMY

**Abstract author(s):** Rodler, Alexandra - Matthys, Sarah (Analytical, Environmental and Geo-Chemistry Research Group, Department of Chemistry, Vrije Universiteit Brussel) - Artioli, Gilberto (Department of Geosciences, University of Padova) - Brøns, Cecilie (The Ny Carlsberg Glyptotek) - Goderis, Steven (Analytical, Environmental and Geo-Chemistry Research Group, Department of Chemistry, Vrije Universiteit Brussel)

**Abstract format:** Oral

So-called Campana reliefs, named after Pietro Campana who published part of his private collection of antiquities in 1851, are polychrome and architectural terracotta reliefs dated between c. 50 BC and 60 AD and depicting, for example, mythological scenes. The studied relief shows a scene with two satyrs picking grapes and was acquired by the Ny Carlsberg Glyptotek, Denmark, at an auction in Rome in 1899. Its specific provenance, however, is unknown and is it is assumed to be from Rome or elsewhere in Central Italy, where most Campana reliefs have been found. The preliminary, non-invasive investigation included VIL imaging and portable XRF, which revealed an abundance of Egyptian blue pigments that dominate the background as well as the floral decoration on top of the of the scene. Egyptian blue pigments were used throughout Egypt, Mesopotamia, Greece and the Roman Empire from as early as c. 2,500 BC to c. 800 AD. It is the earliest artificial pigment and was produced in a complex process involving heating a copper compound along with calcium carbonate, silica and a few percent of a flux. Despite its widespread use amongst ancient Mediterranean cultures, little is known about production centres and the source of materials used for producing Egyptian blue pigments. We collected several samples of Egyptian blue pigments of the studied Campana relief for subsequent lead isotope analysis. The variations in lead isotopic composition of the analysed Egyptian blue samples can be useful for narrowing the geological sources of the copper used for producing these specific pigments. This can indicate whether the Egyptian blue pigments were locally produced in Italy or imported.

8 FORMULATING A CODE OF ETHICS FOR THE SCIENTIFIC ANALYSIS OF ARCHAEOLOGICAL MATERIALS

**Abstract author(s):** Mödlinger, Marianne (University of Genoa) - Godfrey, Evelynne (Uffington Heritage Watch) - Kairiss, Andris (Riga Technical University) - Hajdas, Irka (ETH Zürich)

**Abstract format:** Oral

Members of the EAA Community on the Illicit Trade in Cultural Material formed a Task Force working on the formulation on a Code of Ethics for the scientific analyses of archaeological material. The justification, objectives and structure of the code will be briefly described in the course of the presentation.

This code aims to set minimum standards of professional practice and performance for archaeologists, conservators, and scientists from other disciplines undertaking analysis and investigative conservation of archaeological materials.

In recent years, archaeologists and scientists based in laboratories of different kinds have experienced increasing demands for scientific examination and expert appraisal of archaeological artefacts and samples. These requests derive not only from archaeological field units, public museums, Local or Regional Authorities, universities or other public research institutions, but also from private clients such as antiquities dealers, auction houses, private collections, and individual owners or their representatives.

Private clients requesting such work often seek to obtain a "Certificate of Authenticity". These documents typically focus on scientific measurement of the approximate age of the object by archaeometric dating methods, or evidence for possible forgeries. Presentation of data from scientific analyses, or an expert archaeological appraisal, can in effect help to enhance the saleability, and to increase the financial value, of the object, hence supporting the commercial trade in archaeological material on the art market.

263 FROM FRAGMENTED ARTEFACTS TO HOUSEHOLD ACTIVITIES. POTENTIALS OF HOUSEHOLD ARCHAEOLOGY IN SETTLEMENT RESEARCH

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Szabó, Dóra (University of Exeter) - Soós, Eszter (University of Pécs) - de Souza, Jonas Gregorio (University Pompeu Fabra)

**Format:** Regular session

Household archaeology has undergone profound changes since the establishment of its methodology in the 1970s and remained on the horizon of settlement archaeology right until today. Its fluidity and interdisciplinarity catalyses its constant improvement by the application of diverse methodological techniques. Its flexibility also enables its use in different time periods in a broad geographical scale.

The potential of household archaeology for settlement research is that it can contribute to the understanding of social dynamics of past communities by focusing on the spatial structure and material culture of settlements. Thus, it can provide invaluable informa-

tion about social relations, survival strategies, decision making and competition of households in periods where textual sources are scarce or even where they are abundant.

The focus of this session is the application of the concept of household archaeology in the analysis of settlements and assemblages. The session aims to introduce and discuss existing and new analytical techniques and feasible results-based interpretations and hereby bridge the gap between the plentiful theoretical approaches in household archaeology and their applications in practice.

We encourage contributors to demonstrate these on actual case studies from different time periods across a broad geographical context.

Works for this session can be guided but not limited by the following topics:

- How and to what extent can households be separated at sites in case studies?
- What kind of activities can be identified and how can activity areas be localised?
- Hierarchy and division of labour between households.
- Storage capacity and dish/ tool-sets of households and their changes.
- Refuse management practices.
- Differentiation of possible domestic space and communal space/ shared and separated activity areas.
- Gender-specific areas.
- How can settlement studies benefit from household archaeological approach?

## ABSTRACTS

### 1 INTRODUCTION TO THE SESSION

**Abstract author(s):** Szabó, Dóra (University of Exeter)

**Abstract format:** Oral

The investigation of households was initiated in the 1970s in archaeology and their analysis in social sciences goes back to even earlier dates. Although it is difficult to find a suitable definition for household archaeology – it can be defined as a subfield of settlement archaeology, an advancement from social archaeology or a research area by itself –, it proved to be a durable concept in research. And it was not just kept as an unchanged analytical concept for decades, but it has been rapidly improving and growing owing to the rich contribution of different theoretical approaches and the application of up-to-date analytical techniques and tools.

It also became one of the most interdisciplinary themes in archaeology: material culture studies, bioarchaeology, and soil micromorphology are only a few of the fields which contribute to the investigation of households. The success of the concept might stem from its potential to provide a better understanding about social processes and interaction between individuals and communities in archaeological periods, where written sources are scarce or absent. Another great advantage of the concept is its flexibility, which allows its application in different archaeological periods and in various geographical contexts. This wide variety is well represented by the range of works that were submitted for this session.

This introduction aims to provide an overview of the potential of this diverse and interdisciplinary approach and thus launch the session.

### 2 UNDERSTANDING HOUSEHOLD ACTIVITY AREAS AND CONSTRUCTION MATERIALS IN NEOLITHIC SITES USING ENVIRONMENTAL ARCHAEOLOGY AND ETHNOGRAPHIC ANALYSIS: COMBINING PHYTOLITHS AND GEOCHEMISTRY

**Abstract author(s):** Elliott, Sarah - Jenkins, Emma (Bournemouth University) - Palmer, Carol (Council for British Research in the Levant) - Allcock, Samantha (University of Plymouth)

**Abstract format:** Oral

The Neolithic in southwest Asia is an important period in human history which saw the advent of sedentism, agriculture, and ultimately the rise of complex societies. It is also, however, one of the most poorly understood. This is partly due to problems associated with site recognition and partly because of the lack of preservation of many forms of evidence, particularly biological. As a result, many Neolithic sites are comprised of a series of structures, the construction and function of which is difficult to unravel.

Common methods to investigate the development of archaeological farming villages rely on the interpretation of archaeological contexts and their associated material culture. However, new approaches are being developed to examine past human activities, for example the analysis of sediments and their microscopic remains. We can go one step further and incorporate scientific microscopic techniques in combination with modern ethnoarchaeology to gain further insights. This paper presents the application of multi-methodologies which combine a range of scientific environmental-ethnoarchaeological approaches to answer questions about activities, use of space, construction materials and settlements in the past specifically focusing on Neolithic case studies in the Middle East. This approach that examines microscopic inorganic remains which are not subject to the same preservation issues as artefactual evidence. This method involves the analysis of sediment samples from known activity areas in modern villages which will then act as a comparative dataset to interpret samples from Neolithic sites. This enables key concepts such as sedentarisation and the use of space to be investigated.

### 3

### PLANT PROCESSING ACTIVITIES AT HOUSEHOLD’S LEVELS- A MULTIPROXY APPROACH TO THE USE OF SPACE AT ÇATALHÖYÜK

**Abstract author(s):** Santiago-Marrero, Carlos - Lancelotti, Carla - Madella, Marco (Universitat Pompeu Fabra)

**Abstract format:** Oral

Çatalhöyük is a Neolithic site located on the Konya plain, Turkey. Since its discovery in the early ‘60s, the site has been known for its remarkable preservation revealing architectural, biological and artefactual remains, opening a window into the past lifestyles of one of the first farming communities. Most of what is known about resources exploitation, plant processing, and household activities at the site has been produced by the interpretative potential of the macro-botanical and artefactual remains. However, interpreting households activities solely through macroscopic evidence always raises the question of whether what we are interpreting is indeed reflecting the distribution of activity areas or just the final location or storage of artefactual remains associated with a particular activity (e.g. plant remains clusters, grinding tools cache, etc.) The research here presented focuses on this subject as an attempt to reevaluate various interpretations of plant processing activities and other dwelling practices at Çatalhöyük. For this task, sediment samples were recovered from the whole surface extension of a Neolithic house along with artefactual remains related to plants processing activities located in such inner space. Following, these were subjected to a multiproxy approach integrating micro-botanical remains such as phytoliths and starch, and chemical signatures. Our results add another research line to the use of space and household activities at Çatalhöyük, even in contexts where such tasks are not always evident.

### 4

### FROM SMALL SHERDS TO EVERYDAY PRACTICES: THE GOLDMINERS’ SETTLEMENT AT ADA TEPE (LBA)

**Abstract author(s):** Burkhardt, Laura (Institute for Oriental and European Archaeology)

**Abstract format:** Oral

With this case study, the author wants to show how even from poorly preserved ceramic material of a rescue excavation, meaningful conclusions can be drawn by using the right methods (according to B. Horejs). Building on Schiffer’s fundamental work on formation processes, the statistical data of a spatial and functional analysis of a settlement excavation can be interpreted sensitively and prehistoric everyday practices can be traced.

The site complex of the Late Bronze Age gold mine of Ada Tepe is located in the eastern Rhodopes in Bulgaria and was excavated by H. Popov and his team of the National Archaeological Institute with Museum of the Bulgarian Academy of Sciences in 2009–2015. The excavated data were analysed within the project “Bronze Age Gold Road of the Balkans - Ada Tepe mining” (PI: B. Horejs; funded by the FWF, project no. P-28451) at the Institute of Oriental and European Archaeology in Vienna. This presentation will discuss aspects provided by the researcher’s doctoral thesis (supervised by: B. Horejs, H. Popov, R. Krauß) which is embedded in the project and focuses on the Northeastern-Settlement, which was inhabited by the specialized goldminers.

By using a holistic approach for the recording of the settlement material, context-based statistical analyses were carried out, which were then used for a spatial and functional analysis of the house-contexts and the settlement. Thus, everyday practices of the gold-mining society were reconstructed, whereby different activity zones, functional clusters and everyday life’s strategies could be identified.

The case study of the Northeastern-Settlement offers several perspectives on aspects of household archaeology. One aspect is that all of the available eleven house contexts were analysed, which allows bridging between household archaeology and settlement studies.

### 5

### HOUSEHOLD ACTIVITIES AND WETLAND LIVING. EXAMPLES FROM NORTH ZEALAND, DENMARK

**Abstract author(s):** Pantmann, Pernille (Museum of North Zealand)

**Abstract format:** Oral

By extending the archaeological surveys to include not only the dry parts of Iron Age settlements but also to encompass the wetlands, new perspectives on the settlements appear. This method has been used in North Zealand, during the last 13 years and we have achieved information on very different levels with a wide range of perspectives. Where we used to have little or no household waste from the Iron Age settlements with consequently little or nothing to do analysis on, we now have large quantities. How? Because wetlands, apart from many other functions, were also used for the disposal of household waste.

The perspectives of the household waste are enormous amongst other due to relatively good preservation conditions of the wetland contexts. Thus, faunal remains are a large and promising group of finds, followed by bone artefacts, but also single finds with specific socio-economic significance have proved valuable. Consequently, household waste in wetlands indicates a different type of wetland living than we usually expect.

Traditionally, wetlands in Danish Iron Age contexts are perceived as distant marginal areas, mainly used for sacred activities. They are mainly related to Settlement Archaeology by being perceived as settlement boundaries. Recent excavations and research have challenged this perception. In some cases, wetlands appear to be part parts of the settlements, even parts of the individual farms. The household waste in the wetlands is one key to reconsider wetland utilization and wetland living in Danish early Iron Age.

This presentation is based on a recently finished Ph.D. thesis.



6

HOUSEHOLD ACTIVITIES AND ZONAL COMPLEMENTARY STRATEGIES: A CONTRIBUTION FROM NORTHWEST ARGENTINA (ANFAMA, TUCUMAN PROVINCE)

**Abstract author(s):** Vazquez Fiorani, Agustina (Laboratorio Hercules, Universidade de Evora)

**Abstract format:** Oral

The Andes region present a great ecological diversity for what different ecozones are separated by short distances. Based on that fact, scholars have suggested that andean groups may have simultaneously exploited different environments under a single political and cultural structure as a way of obtaining a large range of resources not available in their origin core area. The zonal complementarity model proposed the existence of chiefdoms whose political elites carried out a process of ethnic colonization towards new ecological areas in the context of an increase of sociopolitical complexity. Those resettlement peasant families were aimed at producing and exploiting new resources, but without losing the land rights and obligations with their main village.

Because the ethnicity is a main component of this model, the studies were focused in the diffusion of stylistic patterns in materiality, specially in ceramics recovered from funerary contexts. Nevertheless, this association between style and culture is not straightforward, specially in the case of burial or ceremonial remains whereas the study architecture, pottery and other artifacts related with domestic spaces allows to avoid the problems related with normative bias and consider the dynamic life-cycle of objects and exchange networks because is in the household were identification patterns are adopted, maintained and transformed during daily activities.

This presentation aims to present the analysis of domestic assemblages in an archaeological site of Northwest Argentina (Anfama, Tucuman Province) and to discuss their relevance to the study of complementary strategies during the Late Intermediate Period (ca. 1000-1500 d.C). We propose that the different materialities analyzed (ceramics, lithics and archaeofauna remains) might have participated in practices related to the processing and consumption of food and that they may have contributed to the social reproduction of the domestic group through the repetition of daily activities.

7

UNLOCKING BUILDING BIOGRAPHIES DURING THE LATE BRONZE AGE IN CENTRAL MACEDONIA: THE CASE OF THE THESSALONIKI TOUMBA TELL SETTLEMENT

**Abstract author(s):** Efkleidou, Kalliopi - Karantoni, Maria - Triantaphyllou, Sevasti - Andreou, Stelios (Aristotle University of Thessaloniki)

**Abstract format:** Oral

During the Late Bronze Age (LBA, 1600-1000 BCE) in Central Macedonia, Greece, habitation was almost exclusively taking place in in small, high and steep-sided tell-type settlements, known locally as toumbes (sing. tumba). Excavation at Thessaloniki Toumba demonstrates a distinctive fixation of the community on the faithful reproduction of the settlement’s layout and the external boundaries of individual buildings for several centuries. The walls of new buildings were constructed right on top of the partly standing mudbrick walls of the preceding architectural phase using similar materials and building techniques.

Tell-type settlements have been widely associated with a social organization model centered on the household. The LBA households have been described as self-sufficient and autonomous social units, which at least at some settlements, included a large number of individuals. The types and distribution of finds display a great variety of activities taking place inside the buildings. There is suggestive evidence, however, that the types and intensity of these activities differed between households and from one settlement horizon to the next.

The present paper will present the results of the systematic analysis of the stratigraphic and architectural data from two buildings of the settlement (Buildings A and B) correlated with the distribution of the different categories of finds (artifacts and ecofacts) located inside the various spaces of these buildings. The analysis is performed within a 3D GIS environment and facilitates the reconstruction of the biography of individual buildings as structures as well as as social spaces within which various fields of action (i.e. domestic economies, production, storage and consumption of foodstuffs) provided an arena for the emergence of intra-settlement rivalries and social differences in the community during the three last centuries of the 2nd millennium BC.

8

COMBINING ARCHAEOLOGICAL SOIL MICROMORPHOLOGY AND PHYTOLITH ANALYSIS. A METHODOLOGICAL APPROACH TO IDENTIFY TECHNIQUES AND MATERIALS OF A HOUSE AT SZÁZHALOMBATTA-FÖLDVÁR

**Abstract author(s):** Peto, Ákos (Szent István University, Faculty of Agricultural and Environmental Sciences) - Kovács, Gabriella - Vicze, Magdolna (‘Matrica’ Museum, Százhalombatta)

**Abstract format:** Oral

Százhalombatta-Földvár Bronze Age tell settlement is amongst the most extensively studied sites of Hungary. Interdisciplinary approach is one of the key factors in understanding and reconstructing the past and household phenomena. For this reason, a range of scientific methods are applied, which include thin section soil micromorphology and phytolith analysis. The high resolution of these techniques is used to add details that are impossible via traditional archaeological means. In this presentation we aim to look at decision making in choices of construction materials. A Middle Bronze Age house, belonging to the so-called Vatia Culture, was sampled to investigate the used materials and techniques. Earthen floors, clay floor, wall and hearth materials are under the microscope for a better understanding of Bronze Age construction. It is also our intention to further test the conjoint application of the

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(RE)CONSIDERING THE DOMESTIC CONTEXTS OF THE LATE ROMAN NILE DELTA

**Abstract author(s):** Marchiori, Giorgia (Durham University)

**Abstract format:** Oral

Houses are not the most popular topic in archaeological research in Egypt. Nonetheless, investigations of domestic buildings at sites throughout the country have highlighted the contribution that the study of houses can make towards the understanding of settlements, society, economy, and the daily life of people. My research looks at domestic contexts of Late Roman Egypt, specifically those located in the sites of the Nile Delta. There still exists a paucity of data on domestic contexts, especially those of the Late Roman period, as much focus has been put on specific sites, such as those along the Nile Valley and the Fayyum region, and other times periods. This has led many to presume a predisposed knowledge of the architecture, use, and internal organisation of houses, particularly based on the results obtained through past excavations of the early 20th century. This paper will provide an overview on the past and current investigation of domestic contexts in Egypt, with a focus on those of the Nile Delta. It will also argue the contribution that a single house case-study can offer, demonstrating that what is already known from other contexts does not necessarily apply to every region.

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COLD CASE AND SMOKING GUN. ROMAN IMPERIAL AND LATE ANTIQUE DWELLINGS IN EPHEOS

**Abstract author(s):** Schwaiger, Helmut - Ladstätter, Sabine (Austrian Archaeological Institute)

**Abstract format:** Oral

The several dwellings of Terrace House 2 in Ephesos are widely renown as finest examples of private architecture of elite residents in the Roman east. The interpretation of the archaeological finds and structures draw a very precise picture of household organisation and the manifold use of space.

Ephesos, on the other hand, is also a city, which had quite an importance during the Late Antique and Early Byzantine period in the Mediterranean East. In the past decade a part of a residential quarter dating to this time has been excavated. Destroyed by a devastating fire while in use, these houses show a status quo of their use and the specific functionalities of their rooms in the 7th century AD. The features indicate a multifunctional usage of these house entities. Parts of the houses served representative needs, other parts had been adopted to provide space for household activities. Additionally, rooms adjoining the street side served as areas providing space for commercial activities, which have been integrated to a certain extend into the household.

Although differing in time, both groups of houses share a common feature concerning their architectonical layout. Structured as peristyle courtyards houses, they use the same spatial solution – however in different ways.

The paper tries to present the organization of households in different times at the same place. The analysis of the finds and the structure show, that certain habits in usage and function apparently remain, whereas other everyday procedures undergo an alteration and have an effect on the organization of Late Antique / Early Byzantine households.

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IRELAND’S FIRST URBAN HOUSEHOLDS: THE POTENTIAL OF HOUSEHOLD ARCHAEOLOGY IN IRELAND’S VIKING TOWNS

**Abstract author(s):** Boyd, Rebecca (University College Cork)

**Abstract format:** Oral

Julia A. Hendon (2008) identifies four pillars to a social archaeology of the household: materiality, day-to-day experience, variability and a need for multi-scalar analysis. I argue that this household perspective is ideally suited to a people-centred exploration of daily life in Ireland’s Viking towns.

Viking Dublin, Cork and Waterford have exceptional archaeological preservation with over 500 excavated buildings ranging from animal pens, workshops and storerooms to small and large residences with hearths, benches, and activity areas. These are set within defined properties, with pits, rubbish dumps, pathways and yard areas. Much of this data was excavated over thirty years ago. Analysis has stagnated and previous scholars (Wallace, 2016) focused on creating typologies of buildings, deliberately underplaying their potential for social interpretations.

The timeframe – 9th – 12th centuries – sees an exceptional change in Ireland’s settlement pattern, the emergence of towns. The size and quality of this dataset allows an exploration of the materiality of the houses and the urban environment. The repetition of building and property footprints traced across centuries of use and reuse provides an opportunity to trace day to day experiences in the households. Variability in house size, construction and individuality at different sites and towns permits us to recognise local and regional patterns. Finally, we can discuss the intimate and domestic scale of individual households, the scale of the town and the scale at which those towns engaged on the wider European stage – Hendon’s multi-scalar analysis.

Exploring these buildings via a household perspective allowed me to reconstruct elements of household lifestyles, choices and identities for the first time in Viking Ireland. Chief amongst this was the identification of an urban identity, expressed architecturally, which eventually surpassed ethnic identities in the towns.

POTS, PITS AND HOUSEHOLDS: DEPOSITIONAL PRACTICES AT VINČA SITE CRKVINE-MALI BORAK

**Abstract author(s):** Tripkovic, Ana (Faculty of Philosophy in Belgrade, Department of Archaeology)

**Abstract format:** Oral

Crkvine-Mali Borak is the Late Neolithic settlement in western Serbia, dated at the very end of the Vinča culture. The site was investigated during 2005-2006 and it is the most extensively excavated Vinča site in the central Balkans to date. Based on the area investigated (2600m²), on the number of pits (55) and houses (13) recorded, as well as the number of small artefacts collected, the site provided high-quality data for the reconstruction of spatial patterning and complexity of household practices. In previous analyses of the site important data on architecture, geomagnetic research, pottery style, and stone artefacts was obtained. In this paper, I will use pit structures as analytical units, and associated potsherds as analytical objects to discuss the diversity of depositional practices across the site. The pits vary in shape, size, and complexity of filling. Although they can also differ in the content within, what they have in common is the abundance of broken pottery. From 140785 potsherds found at the site, almost 30 percent were accumulated in the pits. The taphonomic, as well as fragmentation analyses, were conducted in order to provide better insight into the spatial patterns of household practices across the site.

REFUSE ..... OR REUSE? WASTE MANAGEMENT UNDER THE MICROSCOPE AT SZÁZHALOMBATTA-FÖLDVÁR BRONZE AGE TELL SETTLEMENT

**Abstract author(s):** Kovács, Gabriella - Vicze, Magdolna (Matrica Museum)

**Abstract format:** Oral

Százhalombatta-Földvár is the most extensively researched Bronze Age tell site in Hungary, where the main focus is on everyday life. Natural scientific methods are integral part of the research protocol. Out of these thin section soil micromorphology has been applied since the beginning of the project, as it can supply additional details and insight into various aspects of daily routines. One of these is waste management. There are three aspects of refuse management that are under investigation here. These are cleaning and maintaining, construction and dumping. Sampling and analysing house interiors revealed traces that the need for cleanness was important for the Bronze Age people living here. The regularity of fine-tuned (almost invisible) maintenance suggests a tidiness that was surprising. Recent investigation revealed that refuse material was thoughtfully used during construction. Its treatment show a wide variety of techniques and application. In some cases, probable waste disposal areas could also be detected within the settlement. The utilisation of their material is also discussed in this study. Based on the data it seems that waste management was well thought through and materials were recycled in many cases to the benefit of the settlers.

RECONSTRUCTING HOUSEHOLDS AND FOODWAYS IN LATE-ANTIQUITY ROME: A COMMON WARES PERSPECTIVE

**Abstract author(s):** Pegurri, Alessandra (School of Archaeology and Ancient History - University of Leicester)

**Abstract format:** Oral

This paper investigates how far Common Wares – everyday ceramics, but not cooking wares - can reflect changes in household practices across the key transitional period of Late Antiquity (4th- early 7th centuries AD) in the City of Rome.

Such relatively basic vessels in fact represent an enormous dataset, and yet are greatly under-studied, despite their potential for reconstructing household activities, such as eating habits, but also storage strategies.

By combining morphological studies on ceramic forms and their distribution in different contexts across post-classical Rome, with use-alteration analysis, I will seek to show predilections over time in the choice of vessel types and forms, asking how far such provide insights into late Roman households and food-consumption practices.

The core materials analysed are the late-antique Common Wares from the exceptional recently excavated deposits of the Horti Lamiani area on the Esquiline hill (excavations of Piazza Dante and Piazza Vittorio Emanuele II carried out by the Special Superintendence for Rome’s Archaeological Heritage) and the Curiae Veteres sanctuary on the north-eastern slopes of the Palatine hill (La Sapienza University of Rome) – amounting to c. 19.000 sherds. These deposits are in fact mainly rubbish dumps and/or abandonment layers – common for late antique deposits - the material is almost entirely in secondary deposition but is still extremely valuable for household studies considering the domestic functions of Common Wares, the incredible quantity of sherds and the stratigraphic reliability of these contexts.

In summary, the results of my analysis will shed new light on the changing household practices of late antique Rome and will fill some of the substantial gaps in our understanding of the Roman households.

THE ECONOMY AND LIFE OF THE POPULATION OF MARAY 1 HILLFORT DURING TWO PHASES OF INHABITANCE

**Abstract author(s):** Tsembalyuk, Svetlana (Federal Research Center Tyumen Scientific Center of the SB of the RAS)

**Abstract format:** Poster

We are going to describe the well-stratified settlement of Maray 1 as an example in order to reconstruct the household. Maray 1 settlement is located in the forest-steppe zone of Western Siberia. Its materials represent two initial stages of different historical

periods. In particular, they are a transitional time from the Bronze Age to the Iron Age (IX-VII centuries BC) and the initial stage of the Early Iron Age (IV-II centuries BC). These periods are characterized by completely different economic models. The first period of the exploitation of the site is associated with the Krasnozersk culture population and its activities. That culture was formed as a result of the interaction of taiga migrants who did hunting and fishing and the local forest-steppe population who were cattle farmers. The settlers lived in deep semi-dugouts heated by an open fire. The same fire was used to cook and melt bronze artifacts. A pantry where food supplies, tools, and utensils were stored was added to the living room. The Krasnozersk culture population of Maray 1 settlement was engaged in pottery, metalworking, leather production, weaving, stone and bone working, and other industries. The economy of that period was appropriating (dominated by hunting and fishing) with a small proportion of cattle farming.

A Baitovo culture hillfort (IV-II centuries BC) existed at the site during the second phase of inhabitation. The population lived in above-ground dwellings. They were heated by an open fire. The population used fireplaces for home-based non-ferrous metalworking while ferrous metalworking was practiced in specialized areas of the settlement. We managed to reconstruct such industries as leather production, wood and bone processing, pottery, and weaving. The second period of inhabitation is characterized by activities of a monocultural group, domination of a producing economic model (cattle-breeding) while appropriating industries played a supportive role.

STORAGE AS A SIGNIFICANT PART OF THE HOUSEHOLD ACTIVITIES. DIACHRON ANALYSIS OF THE STORAGE PITS FROM BERETTYÓÚJFALU-PAPP-ZUG (EAST HUNGARY)

**Abstract author(s):** Kósa, Polett - Füzesi, András (Eötvös Loránd University, Institute of Archaeological Sciences)

**Abstract format:** Poster

Household is a widely used conception and analytical unit in the pre- and protohistoric archaeology, although the definition of its boundaries, structures and operation has many methodological problems. The situation seems to be very similar to the classical problem of the Middle Range Theory. Storage as a significant part of the household activities forms the basis of our approach. The food producing societies has a constant problem with durability and preserving food. A series of cultures developed different answers for this challenge during several millennia. In the Carpathian Basin there are a lot of data about storage inside the buildings or in special facilities, in storage jars, above or below the surface and so on. The most frequent solution was the storage pit.

Our presentation is focusing on a series of storage pits found at Berettyóújfalu-Papp-zug, a site which was inhabited in several periods. The excavated part of the site (4.5 hectare) shows human activity almost continuously from the Early Neolithic (cca 6000 BC) to the late Migration period (cca 9 century AD). A significant part of the 2359 unearthed archaeological features were storage pits with different sizes and shapes. We analyse these features according to form, size, upload process and position in the settlement structure of different ages. The purpose of our study is to understand the sociocultural and ecological factors behind installing and using storage pits.

COMMON WARE FROM ARCHAEOLOGICAL WORKS IN THE AMPHITHEATER AREA OF CONIMBRIGA CIVITAS: A PROPOSAL FOR TYPOLOGICAL CLASSIFICATION

**Abstract author(s):** Silva, Iolanda (Iolanda Mouta Silva)

**Abstract format:** Poster

The construction of the concept of Common Ware arises in the twentieth century. Until then, all knowledge from this group of materials was ignored, leading to its disposal in excavations. It’s study was not considered feasible for two reasons: it was considered unenforceable to establish an evolutionary chain because it was thought that the group had few morphological variants, and it was understood that its productions were exclusively local, making knowledge and consequent elaboration of geographical parallelisms impossible. The negative connotation inherent to Common Ware within this thought, giving the concept to all ceramics that did not integrate the picture of the classes of materials with recognized configurations, techniques and functions. Ironically, by dissociating the Common Ware from these groups, it was understood that a independent area of research had been created. Although the boundaries of this concept still raise some discussion in the scientific environment, it is true that the negative connotation inherent in it has already been reversed. It is understood, today, that Common Ware serve as connective tissue in understanding the behaviors and eating habits of populations. They are economic indicators, socialisation components and testimonies of a daily reality. They reveal processes of assimilation and functional awareness. They witness the civilizational paradigms of ancient Rome, as well as the populations that had contact. Our poster presents a typological picture of the various morphologies denouncing standardization, or which atypical models detected in Conímbriga, plus perceiving a first attempt to typological and technological evolutionary lines of these Common Ware. Through statistics and mathematical relationship, based on a form-function proposition, determine in the case of the population of Conimbriga. For a finer assessment, i.e. trying to determine which foodstuffs have been in contact with our Ceramics, we will use nano spectroscopy, through these have an first understanding of eating habits.



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CONNECTING PEOPLE AND IDEAS: NETWORKS AND NETWORKING IN THE HISTORY OF ARCHAEOLOGY

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Arnold, Bettina (University of Wisconsin-Milwaukee) - Coltofean-Arizancu, Laura (University of Barcelona) - Bartosiewicz, László (Stockholm University)

**Format:** Regular session

Before internet and electronic communication, letters served the same function as emails and telegrams were the equivalent of social media today. Conferences and other formal and informal in-person meetings were the main occasions for scientific networking. This is where researchers met, discussed ideas and made contacts that were added to their social and academic networks. These networks were used for multiple purposes, from personal to professional and from scientific to non-scientific. They connected the East with the West and the North with the South and were maintained through correspondence in which people not only shared thoughts, but also sent each other artefacts, replicas, photographs, drafts of publications, journals and books. Studying these networks and their configurations is an important means of reconstructing the history of archaeology.

This session aims to explore networks and the various networking modes throughout the history of archaeology in Europe and beyond, from the nineteenth to the twentieth century. We welcome papers that examine any of the following topics: archaeological actors (e.g., scholars, collectors, amateurs, illustrators and others without formal training); the structures, patterns and dynamics of networks in archaeology and the strategies used for building them; the advantages and disadvantages of being part of networks formed around archaeological collections, museums, departments and other societies and institutions; and the role of networks and networking in the inclusion of women in the discipline, especially in the establishment of hierarchies and power relationships in the field. We would also like to encourage discussions on the importance of networks and networking in the production, transfer and exchange of knowledge, as well as in the dissemination of archaeological theories and ideas, excavations, finds and research results; the multidisciplinary and interdisciplinary collaborations that resulted from these interactions; and the exchange of objects, both archaeological and non-archaeological, that often accompanied correspondence.

ABSTRACTS

- 1

INTELLECTUAL IDEAS AND FAMILY NETWORKS IN 18TH-CENTURY COLLECTION PRACTICE OF PREHISTORIC AND ARCHAEOLOGICAL OBJECTS IN THE GERMAN LANDS

**Abstract author(s):** Eppler, Kirsten (Gotha Research Centre of the University of Erfurt)

**Abstract format:** Oral

The Olearii, a family of theologians and scholars in 17th and 18th century Saxo-Thuringia in the German lands, consisted of three generations – father, son and grandson – of archaeological object lovers and collectors. Every generation showed great interest in prehistoric ceramics and artifacts. Inheriting the archaeological collection via the paternal line respectively the oldest son further expanded the collection as well as the scholarly ideas connected with those objects.

During personal visits and via correspondence with scholarly friends, officials or other family members whose spare time activities also consisted of collecting curiosities and books, there was an exchange of objects and ideas: During personal visits those early amateur archaeologists showed each other collections and artifacts, discussing use, origin, the archaeological record, circumstances of their findings like position and geographic direction in detail. To build stronger interfamilial bonds the Olearii got archaeological objects as gifts.

Collection and network activities of the Olearii resulted in two famous publications engaging with those artifacts and their cultural historic interpretation and classification like usage and age – but did not cross the limits of the given biblical timeframe: „Historia Urnae Sepulcralis Sarmaticae“ written in 1679 by a student of Johann Gottlieb Olearius (1635-1711), founder of the Olearius collection and „Mausoleum in Museo“ published in 1701 by Johann Gottlieb’s son Johann Christoph Olearius (1668-1747). Intra- and extra-familial networks contributed to an increase in archaeological knowledge.

The paper presents a small network of antiquarians that existed (probably in addition to many others) before the era of the Three-Age-System and before the Biblical chronological 6000-year time frame for the age of the earth was challenged. This period served as a prequel to the following developments in prehistory and its often new evolving scholarly networks in the 19th century and thus contributing to an „archaeology before prehistoric archaeology“.
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“MEIN LIEBER FREUND!” 19TH C. CORRESPONDENCE NETWORKS AND THE EARLY HISTORY OF THE MILWAUKEE PUBLIC MUSEUM

**Abstract author(s):** Arnold, Bettina (University of Wisconsin Milwaukee; Milwaukee Public Museum)

**Abstract format:** Oral

The first few decades of the Milwaukee Public Museum (MPM), which dates back to 1851 with the founding of the German-English Academy by Peter Engelmann, is documented in the MPM Library and the Wisconsin Historical Society’s archives entirely in German and often in Sütterlin script. The founding members of the institution were almost all German-born and maintained contacts with

the German-speaking areas of Europe through extensive scholarly correspondence as well as occasional trips to the Old Country to obtain specimens and interact with like-minded colleagues. While the history of the MPM in the early twentieth century is well documented (it was officially chartered in 1882) the same is not true for the first thirty years of its existence, due to the dual barriers of language and the esoteric script used by those educated in a German-speaking school system at the time. This paper will focus on the hidden history represented by the correspondence between two of the most important of the founding members of the MPM: its first director, Carl (Charles) Dörflinger and Adolph Meinecke, charged with overseeing the design and construction of the first museum building. Meinecke’s letters to Dörflinger during a trip to Europe in 1884/1885 that ranged from England to Switzerland and Italy and his native Oldenburg in Germany reveals the value of such source material for enhancing our understanding of information exchange and knowledge transfer in a world before the internet.

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ANTIQUARIANISM AS THE ‘NOBLEST STUDY’: JOSEPH MAYER’S CULTURAL CONTRIBUTION TO THE GLORY OF LIVERPOOL

**Abstract author(s):** Effros, Bonnie (University of Liverpool)

**Abstract format:** Oral

Joseph Mayer (d.1886) was a highly successful goldsmith based for much of his adult life in Liverpool, England. His antiquarian collecting activities, both locally and abroad, were sufficiently prolific for him to open an Egyptian museum in his home on Colquitt Street in 1855. Most famously, he also acquired the eighteenth-century Faussett collection of Anglo-Saxon antiquities from Kent after they were turned down by the British Museum. In 1867, in the interest of making these resources available to the public, and to boost the cultural standing of a city that had grown wealthy on the slave trade, cotton, and sugar, he donated his collection to the Liverpool Free Library and Museum (1860). However, in May 1941, a German incendiary bomb severely damaged the museum and forced its closure for decades; when the museum fully reopened in 1966, the gallery in his name was not reconstructed. As a result, although many of Mayer’s antiquities still form the core of Liverpool’s World Museum’s permanent collection, many have forgotten his legacy. In this presentation, I will address Mayer’s perception of antiquities as cultural capital in a city that had made its name in trade and industrial achievements but which had neglected until recently an investment in the arts. Crucial to Mayer’s successful entrance into antiquarian collecting (despite his own lack of formal education) was his experience of the transformative effects of membership in antiquarian societies. An elected member of the Society of Antiquaries of London from 1850, Mayer was also the co-founder of the Historic Society of Lancashire and Cheshire. There is no doubt that these professional networks, and the colleagues he gained through them, made Mayer a firm believer in the contribution of antiquarianism and archaeology to personal self-improvement and a well-rounded citizenry.
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AGDA MONTELIUS & ITALY, OR HOW TO FIND PEOPLE AND PRACTICES BEHIND A GREAT MAN’S WORK

**Abstract author(s):** Gustavsson, Anna (Dep of Historical Studies, University of Gothenburg)

**Abstract format:** Oral

In 1876, Agda Montelius (1850-1920) participated at the International Congress of Prehistory (CIAAP) in Budapest, together with her husband, the famous Swedish archaeologist Oscar Montelius (1842-1921). The event was part of a 6-month research journey, and the beginning of their massive research and collecting activities in Europe, leading to the publication of Oscar Montelius’ “La Civilisation Primitive en Italie Depuis L’introduction Des Métaux”, two decades later. Agda is mainly known for her engagement in women’s rights and charity work, but she was also an experienced traveler, amateur archaeologist and illustrator.

This paper discusses the presence and performance of Agda Montelius, in her husband’s international (net)work, and how it is methodologically possible to identify less visible actors, and to reconstruct practices underlying the formation of networks by drawing on a combination of archival sources, including letters and travel diaries. Agda’s notes are often the only source of information on how and when her husband met colleagues, and of her participation in networking, where wives played a significant role. Through the archaeological network of her husband, Agda also developed connections that were of importance for her charity work.

Furthermore, this paper addresses practices, such as the organization of archives, which have contributed to the (in)visibility of certain actors in the creation of archaeological knowledge. Agda Montelius’ extensive travelling and her work alongside Oscar, documenting finds in European museums, might have been unusual at the time. However, more invisible female participation in research activities was common. By delving more deeply into the work of a “great man” like Oscar Montelius, it is possible to come to a more nuanced understanding of how the creation of networks and archaeological knowledge took place, and to highlight the collective effort represented by all such projects.
- 5

THE PIONEERING WOMEN ARCHAEOLOGISTS IN 20TH CENTURY GREECE AND THEIR DIFFICULT STRUGGLE

**Abstract author(s):** Pateraki, Kleanthi (Independent Researcher)

**Abstract format:** Oral

The aim of the oral presentation is to present the pioneering women (Greek and foreign) archaeologists, who broke fresh ground in the field of archaeology in 20th century Greece. These specific women engaged in a difficult but courageous struggle against prejudices, stereotypes and limitations of the patriarchal society. Their long-time efforts to develop networks in the discipline and the imprint they left in the field will be mentioned. They contributed not only to the acceptance of women archaeologists in the until then



closed male-dominated professional field in Greece, but also to the creation of the appropriate conditions for future generations of women archaeologists.

The following case studies will be presented: Semni Papaspyridi-Karouzou (the first woman archaeologist in the Greek Archaeological Service in 1921), Anna Apostolaki (the first woman full member of the Archaeological Society since 1906) and Irene Varoucha-Christodouloupoulou (Director of the Numismatic Museum of Athens during the years 1940-1964).

The work of foreign women archaeologists such as the American Harriet Ann Boyd Hawes and Edith Hayward Hall Dohan, who carried out excavations in the Minoan sites in Crete, also will be highlighted.

## 6 RESEARCHING THE WHEELER CIRCUS: THE STRUCTURE AND DYNAMICS OF AN ARCHAEOLOGICAL NETWORK IN 1920S/1930S ENGLAND

**Abstract author(s):** Wallace, Colin (Private scholar)

**Abstract format:** Oral

This paper explores the archaeological network that grew around the fieldwork projects of Robert Eric Mortimer Wheeler (1890-1976) and Tessa Verney Wheeler (1893-1936). Its approach combines some social history of archaeology – as many women excavation-directors as men came up through the hierarchy of these projects – with an example of the importance of networking in the production and exchange of knowledge on European later prehistory and early urbanism. The ‘Wheeler Circus’ (a term of the time, used approvingly) drew on the skills of a wide range of actors, such as labourers, the unemployed, amateurs, nascent professionals, students from across the British Empire, and scholars in other disciplines. It productively linked a number of newer and older British archaeological institutions (the University of London, the London Museum, the Archaeological Institute, the Society of Antiquaries, regional museums and societies) and ended up following the logic of contemporary ideas on cross-channel connections in prehistory by (temporarily) leaving England’s shores for excavations in France. The main projects are relatively well-discussed in the history of archaeology. However, the network and the networkers other than the Wheelers are not nearly so well-explored, and much has thereby been missed.

## 7 THE INFLUENCE OF STUART PIGGOTT ON MORTIMER WHEELER AND THE ARCHAEOLOGY OF SOUTH ASIA

**Abstract author(s):** Miller, Heidi (Middlesex Community College)

**Abstract format:** Oral

Mortimer Wheeler was appointed Director-General of the Archaeological Survey of India in 1944 without ever visiting South Asia and knowing very little about the history and archaeology of the Subcontinent. In his 1950 address to the Council for British Archaeology he admits how overwhelmed he was by the sheer volume of archaeological remains in India. Wheeler’s correspondence with Stuart Piggott, then serving in Delhi during World War II, reveals how Wheeler appropriated information and ideas about the Archaeological Survey department and staff as well as Piggott’s interpretations of the archaeological record, making them his own. Stories about how Piggott and Wheeler interacted and shared information while both were in India reveals how Wheeler relied on Piggott for information Wheeler could use as well as validation of his own biased views. For example, Wheeler relied on Piggott to confirm and celebrate his finding of terra sigillata in South Asia, and Wheeler tried to wrangle Piggott into co-directing excavations with him. In actual fact, Piggott’s letters home reveal that he loathed India, especially the climate and the people, and only studied material readily available in Delhi as a distraction to make his service more palatable and when he was released from duty quickly made his way back to England, never to set foot in South Asia again. We often assume that Mortimer Wheeler was the great influencer, yet examination of archival records shows that it was Piggott who influenced Wheeler as regards the archaeology of South Asia. Together, they created a biased knowledge base, interpreting the ancient history of the Subcontinent through the lens of the history of England, and their bombastic rhetoric poisoned older curated collections. This presentation will examine the interaction between Piggott and Wheeler and how their ideas and interpretations do not hold up under close scrutiny.

## 8 KIRÁLY PÁL – RESEARCHER OF THE ROMAN AGE

**Abstract author(s):** Bodó, Cristina (Muzeul Civilizatiei Dacice si Romane, Deva)

**Abstract format:** Oral

The History and Archaeology Society of Hunedoara County was founded at Deva in 1880. Archaeological researches had begun in several locations of the county under the patronage of this institution, the most famous being the ones at Sarmizegetusa. They began in 1882 under the leadership of archaeologists Téglás Gábor and Király Pál.

These investigations were carried out with the funding (and under the control) of the Ministry of Cults and Education, to which the research reports were sent annually. Probably, this support should be understood in the context of the particular interest shown, in the second half of the 19th century, for the research of the Roman period (including as part of the effort of building a common imperial identity).

Just like many of the enthusiastic active members of the newly established Society, Király Pál was a teacher at the Superior Royal Hungarian Realschule of Deva, since 1877. Passionate about history, he was more interested in recent history at the beginning of his career in the first half of the 19th century. Later, after 1880, his attention was drawn towards archaeology, especially research on

the Roman period. In the following years and until his departure from Deva in 1892, he coordinated the archaeological excavations at Sarmizegetusa, unearthing important monuments – the ‘Syrian’ temple, the Mithraeum, the first investigations of the

amphitheatre. He published numerous papers through which he had valorised the results of the respective researches; the Mithraic discoveries at Sarmizegetusa and the Mithraic studies occupied a significant place, drawing the contemporary researchers’ attention to his work on this important site in Hunedoara County. This paper examines the roles of the networks developed by Király Pál, both within and outside the local History and Archaeology Society, in carrying out his archaeological research in Hunedoara County and in disseminating his finds.

## 9 SZINTE GÁBOR AND THE BEGINNINGS OF THE RESEARCH ON THE MEDIEVAL MONUMENTS FROM HUNEDOARA COUNTY

**Abstract author(s):** Codrea, Ionut - Bodó, Cristina (Muzeul Civilizatiei Dacice si Romane)

**Abstract format:** Oral

Founded in 1880, the History and Archaeology Society of Hunedoara County had also amongst its objectives the inventory and the salvage of the historical monuments on the territory of the county. Szinte Gábor is one of the people with a rich activity in this respect.

He graduated in 1879 from the National Drawing School and, starting with the scholar academic year 1883-1884, he was appointed as drawing teacher at the Superior Royal Hungarian Real schule of Deva. He became almost immediately a member of the Hunedoara History Society, providing his talent in drawing and photography until 1897, when he departed for Budapest. Although he was renowned especially for his ethnography researches, he participated at diverse investigations of the ancient and medieval monuments of Hunedoara together with Téglás Gábor and Király Pál. Illustrator and photographer, Szinte contributed to the knowledge of these sites, capturing certain aspects which are no longer preserved.

Through the Society, Szinte Gábor participated in the national programme organised by the National Monuments’ Committee which aimed at the discovery and rescue of medieval frescoes. Thus, in 1883 and 1884 he was commissioned to measure the churches in Streisângeorgiu, Bârsău and Deva and to draw their frescoes. Starting from this project his interest for the medieval monuments increased and materialized in further research on ecclesiastical buildings in Hunedoara County.

This paper examines the modes in which Szinte Gábor’s network of archaeologists, historians, collectors and other enthusiasts, formed within the Hunedoara History and Archaeology Society, contributed to expanding his research interests, as well to the incorporation of professional illustrations and photography into nineteenth-century Transylvanian archaeology.

## 10 ARCHAEOLOGICAL SCHOLARLY SOCIETIES IN THE KINGDOM OF YUGOSLAVIA: CHANGING STATES AND ROLES

**Abstract author(s):** Lorber, Crtomir (University of Ljubljana)

**Abstract format:** Oral

In the history of archaeology in the southeastern Europe the end of the First World War signifies the end of centennial Empires and of a political order that put great faith in archaeology as a science. Yugoslavia was formed, uniting most of the South Slavic nations. The paper explores how archaeological societies functioned in new social and political circumstances, especially after the formal break with the ‘Austrian’ institutional and disciplinary organisation. The paper will demonstrate that though official institutional contacts and cooperation largely ended, personal networks from the preceding period survived. Experiences stemming from the preceding system and practice were instrumental for attempts to create new ‘Yugoslav’ scholarly organisation(s) of archaeologists. To this end, three meetings of different national, regional and local antiquarian and museum societies were organized between 1922 and 1923, but the initiative faded away. Similar ideas re-emerged in 1930s, but, with the exception of some cooperation on projects (i.e. Archaeological map of Yugoslavia) and events (Tabula Imperii Romani conference in 1937 in Ptuj), these attempts remained unsuccessful. This paper will show the reasons for this and why the establishment of the strong all-Yugoslav archaeological society succeeded later in Socialist Yugoslavia. We try to show the importance of these meetings, especially through the ideas and surviving projects, as well as the international cooperation, encouraged through the initiative of individual scholars through the 1930-s. We offer a look through the developing legislation for protecting cultural heritage in the Kingdom of Yugoslavia and other ideas, such as those regarding the formation of the central all-Yugoslav archaeological institute. In the end we try to explain why most of the projects and organizational reforms were never implemented and why did Yugoslavia have to wait for the aftermath of the Second World War for the development of an actual all-Yugoslav archaeological society?

## 11 CONGRESSES AS NETWORKING HUBS: THE INTERNATIONAL CONGRESS OF PREHISTORY AND ITS ROLE IN SHAPING PREHISTORIC ARCHAEOLOGY IN NINETEENTH-CENTURY HUNGARY

**Abstract author(s):** Coltofean-Arizancu, Laura (University of Barcelona)

**Abstract format:** Oral

Congresses and conferences were and still are the main occasions for scientific networking both in archaeology and other disciplines. In the nineteenth century, the various editions of the Congrès international d’anthropologie et d’archéologie préhistoriques (CIAAP; International Congress of Prehistory), founded by Édouard Desor and Gabriel de Mortillet in Italy and Switzerland between

1865 and 1866, were crucial to the development of prehistoric archaeology and in shaping archaeological thought in various European countries. This paper explores the role of CIAAPs as networking hubs in nineteenth-century archaeology by focusing on the case study of the 8th CIAAP which took place at the Hungarian National Museum in Budapest, Hungary, in September 1876. This event was a major turning point in Hungarian archaeology. It symbolized its international recognition and significantly contributed to maturing prehistoric archaeology into a distinct research field within the country. It was also an event attended by numerous international scholars, collectors and people of different backgrounds, which increased the opportunities for building and strengthening collaborations across the globe. The paper will particularly examine and discuss the networking processes that took place before, during and after CIAAP 1876, both through correspondence and in-person interactions; the complex and dynamic network(s) of archaeological actors that were formed around this congress; its subsequent role in the production, transfer and exchange of knowledge, in the dissemination of archaeological theories, excavations, finds, collections and research results, as well as in fostering multidisciplinary and interdisciplinary collaborations in Hungarian archaeology.

12

## FIFTY YEARS OF NETWORKING IN ARCHAEOZOOLOGY

**Abstract author(s):** Bartosiewicz, Laszlo (Osteoarchaeological Research Laboratory, Stockholm University)

**Abstract format:** Oral

In 1989 two events of global impact coincided in Europe: the “Iron Curtain” (a metaphor popularized by Sir Winston Churchill) was torn down between East and West, and Sir Tim Berners-Lee invented the World Wide Web. In the meantime, the International Council for Archaeozoology (ICAZ) was coming of age then having been founded 18 years earlier in 1971, during the Third International Congress of Agricultural Museums in Budapest. Archaeozoologists, holding a special session on domestication, arrived from 18 countries. They included the founding fathers of what was to become ICAZ. By 1971 Hungary was equally accessible to “socialist” and “capitalist” scholars at the wake of the Cold War. Some participants already had personal contacts in the opposite half of Europe. German colleagues had known each other from before the 1961 erection of the Berlin Wall. Sándor Bökönyi, one of the organizers, had participated in British and US projects in former Yugoslavia and Iraq. Anneke T. Clason of the Netherlands, the first secretary of ICAZ, actually had relatives in Hungary. Personal networks and the keen consciousness of the need to cross-cut political boundaries have become fundamental assets to the organization. In 1990 ICAZ had its first meeting outside Europe. My presentation is a review of diachronic diversification within ICAZ during the last 50 years. It is based on the analysis of programmes of its conferences organized every four years as well as recent membership data.

13

## NETWORKING AND THE DEVELOPMENT OF ARCHAEOLOGICAL SITES AND MONUMENTS RECORDS IN ENGLAND 1967-89: THE EVIDENCE OF ORAL HISTORIES

**Abstract author(s):** Bryant, Stewart (University of Oxford) - Cooper, Anwen (University of Manchester)

**Abstract format:** Oral

The national network of local sites and monuments records in England (now called historic environment records) contain over 1.7 million records and are used to conserve over 90% of the archaeological heritage. Nine archaeologists were interviewed who were involved in the creation and development of six sites and monuments records in two contrasting regions of England between their beginnings at Oxfordshire in 1967 and the creation of a full national network in 1989.

The paper will explore the role of formal and informal archaeological networks in the dissemination of ideas, the transfer of skills and the provision of social and professional support during this early, formative period of SMRs using the evidence of oral histories. It will also consider the influence of other methods of communicating ideas and will compare the role of networking with that of the personal agency of the interviewees in the creation and development of the SMR network.

14

## NORDIC NETWORKS AND THE VÖLKISCH TURN IN IRISH ARCHAEOLOGY

**Abstract author(s):** Whitefield, Andrew (National University of Ireland, Galway)

**Abstract format:** Oral

Under British colonial rule, archaeology in Ireland had been dominated by a small, largely Anglo-Irish, elite. Following the establishment of the Irish Free State in 1922, the Swedish folklorist Professor Nils Lithberg was engaged by the Department of Education to oversee the reformation of the National Museum of Ireland (NMI). Lithberg’s appointment followed many years of academic co-operation between Irish folklorists and Celticists, and their counterparts in northern and central Europe—particularly Germany and Scandinavia.

Archaeology in Ireland took a decisively völkisch turn following Lithberg’s recommendation that a new folklife collection be acquired by the NMI for display alongside material from Ireland’s pre-colonial Golden Ages. This would serve to emphasise cultural continuity from deepest antiquity to twentieth-century Gaelic Ireland. British imperial artefacts in the museum’s collections were to be replaced with comparative material from Continental Europe, emphasising historic and prehistoric Celtic connections.

The implementation of Lithberg’s recommendations fell to the Austrian archaeologist Adolf Mahr, who was appointed keeper, then director, at the NMI. Mahr, a fervent Nazi, was a keen proponent of völkisch-inspired settlement archaeology. He used his network of contacts to organise training for the archaeologists that would go on to dominate the discipline in Ireland during the post-war period. Almost all the senior archaeologists of that generation in Ireland received advanced archaeological training in Germany.

As this contribution will demonstrate, the networks Mahr cultivated—from international scholars, to political ideologists, to local historical societies—continue to influence archaeological theory and practice in Ireland today.

15

## CAUGHT IN THE CROSSFIRE? MIODRAG GRBIĆ BETWEEN THE GERMAN AND AMERICAN ARCHAEOLOGICAL EXPEDITIONS IN THE KINGDOM OF YUGOSLAVIA

**Abstract author(s):** Bandovic, Aleksandar (National Museum in Belgrade)

**Abstract format:** Oral

Many historians and sociologists of science claim that understanding of scientific ideas becomes more nuanced through the analysis of the networks of interaction between contemporaries. These studies insist that the success of certain ideas is not based on the individual genius of the scientist but rather on the convenient branching of scientific networks. Simultaneously the analysis of scientific networks speaks in favor of the viewpoint that ideas do not appear in a social vacuum. By reconsidering consequential aspects of the network created between Serbian archaeologist Miodrag Grbić (1901-1969) and members of two international expeditions in Yugoslavia during the 1930s it will be possible to review the meaning and significance of networking. The German archaeological expedition led by Wilhelm Unverzagt (1892-1971) started excavation of Hellenistic settlement Gradište near Lake Ohrid (1931/1932) in present-day North Macedonia. In the same year, the American School of Prehistoric Research led by Vladimir Fewkes (1901-1941), Czech-born American archaeologist, began excavating Starčevo, an early Neolithic settlement near Belgrade. As a prehistorian and curator of the National Museum in Belgrade, Grbić took part in both expeditions, becoming a guide and the mediator not only between the locals and expeditions but also between the two expeditions. Both expeditions shared the familiar set of ideas, among others the preconception that the territory of Balkans is a crossroads and the bridge between Asia and Europe, between „East“ and „West“. Both expeditions were driven by a similar belief that archaeological exploration of Yugoslavia could reveal crucial questions of European origins and identity. The networks Grbić created show the tight interconnections between personal motivations, scientific and political ideas.

16

## NETWORKS CONNECTING ARCHAEOLOGISTS AND AUTHORITIES IN SICILY (1940-45): PIETRO GRIFFO AND JOLIE BOVIO DURING WORLD WAR 2

**Abstract author(s):** Crisà, Antonino (Ghent University)

**Abstract format:** Oral

Following the declaration of war by Italy in June 1940, the Allies began the extensive bombing of Italian cities. Sicily was probably one of the most bombarded Italian regions suffering much destruction in urban areas, ports and infrastructure. Since archaeological sites and museums were in serious danger, national and regional authorities carried out essential plans to protect the island’s antiquities.

Pietro Griffo (1911-2007) and Jolie Bovio Marconi (1897-1986), in particular played essential roles during World War 2. Both archaeologists, employed at the local Superintendencies of Agrigento and Palermo, were fully committed to safeguard antiquities in a state of war, protecting ancient monuments and securing archaeological collections at local museums.

The scope of my paper is to assess the role of Griffo and Bovio Marconi as primary ‘actors’ of local, regional and national networks, which comprised a series of units/members involved in the protection of antiquities during World War 2. These networks included safeguarding authorities, custodians, museum directors, workers, city majors and military personnel. First, I contextualise my paper within my current research project, carried out at Ghent University (Marie Skłodowska-Curie Individual Fellowship). It explores the impact of war on Sicilian archaeology and communities. Second, I present select, effective case studies on Agrigento and Palermo. Griffo strongly opposed a series of unauthorised excavations and activities by the Italian army at Agrigento, which put archaeological buildings at serious risk. He was therefore part of a wider network, which connected civilian and military authorities, clashing with each other. On the other side, Bovio Marconi, as the Director of the Palermo Museum and Superintendent (the first woman with such roles in Sicily), dealt with the construction of anti-raid shelters in archaeological urban areas. Thus, she acted within a ‘civilian’ network, interacting with council, regional and state authorities.

17

## THIS IS LISBON CALLING: GERMANS AND FRENCH IN PORTUGUESE ARCHAEOLOGY DURING THE 1960S

**Abstract author(s):** Martins, Ana Cristina (IHC - pólo Universidade de Évora; Uniarq - ULisboa)

**Abstract format:** Oral

Like in most countries, archaeology in Portugal was always deeply influenced by foreign researchers through various channels, from letters, books and journals to exhibitions and congresses. This was especially true during the 19th century, but also in the 20th. Initially, the influence was predominantly French, but then German archaeology was gradually introduced in the country by Spanish colleagues, and this was finally followed by the contact with the British school. However, it was during the 1960s that, thanks to a new political internal context and economic cycle, as well as to a renewed scientific policy, Portuguese archaeology benefitted from a wider and promising contact with two European archaeological schools: the German and the French. This contact, which changed Portuguese archaeology forever, consisted in different collaborations with these schools and the presence of their representatives in the country.



This paper aims to identify and analyse the actors of these specific networks, their role in the production, transfer and exchange of archaeological knowledge, in the dissemination of archaeological theories, methods and research results, as well as in fostering multidisciplinary collaborations.

267 **RECYCLING CULTURES: INTERPRETING THE WAYS RE-USING AND RECYCLING OF THE MATERIAL CULTURE AND LANDSCAPE ARE ATTESTED IN THE ARCHAEOLOGICAL RECORD**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Georgiadis, Mercourios (Institute of Classcial Archaeology in Catalunya) - Kefalidou, Eurydice (University of Athens) - Dimakis, Nikolas (University of Athens; University of Crete)

**Format:** Session with keynote presentation and discussion

Garbage is a useful source of cultural information about the past. The final deposition of objects is what we come across in our archaeological work often in the form of rubbish heaps or pits. Several studies related to the analysis of materials focus on the “object biography”, suggesting that it is important to consider not only the original purpose for which an artefact may have been made, but also the different ways that it may have been used through its lifetime and also its secondary uses. These different ‘lives of objects’ include the restorations, welds, modifications, adaptations, and sometimes even the concealment or the ‘curation’ (the retention of an artefact well beyond its production date) or the purposeful ‘destructions’ of objects.

All these actions aim to a new use and a new life of material culture, incorporate different meanings and entail certain changes in its cultural perception and use. Moreover, analyses of ancient materiality emphasize the need for detailed and in-depth research of the issue of secondary uses, and to clarify aspects of the use and life of objects. Recent developments in the fields of Landscape Archaeology provide new tool that can help us to understand the various forms the reuse of landscape had in different periods.

In the current session we welcome papers on any aspects of re-use or recycling of materials and/or landscapes, interpretations of their role and importance in their context, studies on garbage assemblages, biographies of objects and purposeful destructions of items throughout antiquity.

**ABSTRACTS**

1 **TRACKING RE-CYCLING: ARCHAEOLOGICAL AND ANTHROPOLOGICAL SURVEY IN THE HABITAT OF XANTHI REGION-THRACE, GREECE (TRAASH, 2020-2022)**

**Abstract author(s):** Kefalidou, Eurydice (National and Kapodistrian University of Athens)

**Abstract format:** Oral

TRAASH is an interdisciplinary synergy funded by the Hellenic Foundation for Research and Innovation. Experts from diverse backgrounds collaborate in order to bring to the fore various dimensions of recycling and reuse in the past and present through a diachronic analysis of all these aspects in the Xanthi region-Thrace, northeast Greece. This region, with its diverse past and present rural societies, can provide a paradigm of environmental and material sustainability for present and future application in modern societies.

Our team includes archaeologists, anthropologists, ethnographers, museologists, and a local trash-artist. We will be able to record, study, interpret, harness and display (via our site and temporary exhibitions and educational programmes) the various -continuous, evolving or alternating- ways of exploiting and managing the objects, the landscape and the natural resources, which can provide a footprint of how distinct cultural groups acted through time.

This synthesis of different outlooks will provide a unique and at the same time multi-vocal, as far as the disciplines are concerned, research output. Moreover, the overall conceptualization and practice of recycling and reusing/readapting has a significant symbolic meaning with a strong cultural character from the prehistoric time until today.

2 **THE REUSE, RECYCLING AND MODIFICATION OF OBJECTS AND LANDSCAPE IN AEGEAN PREHISTORY**

**Abstract author(s):** Georgiadis, Mercourios (Institute of Classcial Archaeology in Catalunya)

**Abstract format:** Oral

The reuse and recycling of objects is considered a modern issue, addressing problems related to the overexploitation of resources. However, these concepts are not only very old, but they have far more reaching applications and follow a number of cultural behaviours. The focus of the current paper will be on the Aegean prehistory and various examples from different periods will be used. The diachronic analysis of the landscape has demonstrated that various sites have been reused and even in some sense recycled in prehistoric and later times in a number of modes. Spaces within settlements, like tells, have often repeatedly re-used, accommodating specific structures. Objects whose material varies, including bone, stone and clay can be modified, broken and made functional again in a number of cases. Some patterns of such changes can be seen to be regular with a practical character and others highly symbolic. Examples from different regions and prehistoric phases from the Neolithic until the LBA will be shown, demonstrating the diversity and character of reuse and modification in their cultural context.

3 **REVELIO! USING PATTERNS OF REPAIR AND MODIFICATION AS INDIRECT EVIDENCE TO UNDERSTAND METAL RECYCLING**

**Abstract author(s):** Aulsebrook, Stephanie (Uniwersytet Warszawski)

**Abstract format:** Oral

The ease with which metal artefacts can be recycled, potentially obliterating all traces of their former use, means that metalwork is significantly under-represented in the archaeological record. Although it will never be possible to reconstruct this important missing evidence, the examination of object biographies can help us to better understand the social choices that lay behind the process of metal recycling by identifying the circumstances when the option to recycle was deliberately rejected and another course of action chosen instead. I have previously applied this approach to the corpus of Late Bronze Age metal vessels from the Greek mainland, successfully revealing differences in the recycling, repair and modification strategies adopted according to the vessel shape and type of metal used. In this paper I will discuss how I intend to build upon this work through the database of material I am collating as part of the ongoing project ‘Forging Society at Mycenae: the Relationships between People and Metals’.

4 **SECONDARY TREATMENT OF DEATH IN ABDERA**

**Abstract author(s):** Dimakis, Nikolas (University of Athens)

**Abstract format:** Oral

Archaeological studies of mortuary practices in Classical Greece focus upon the material remains in their reconstruction of the ritual surrounding death and of the social systems in which such customs were embedded. Re-used or repaired graves, fragmented or “out-of-context/circulation” burial offerings, accumulated or scattered around skeletal remains (disiecta membra), etc., have often been neglected or dismissed by Classical archaeologists as evidence for looting activity, various post-depositional disturbances or even non-human agents. However, greater emphasis should be placed on the investigation of the post-funeral interference with the long departed as this may reveal varying attitudes toward death and the dead even when they are not so readily revealed by other funerary rites. In spite of the lack of anthropological analysis, attention here is drawn on a number of graves from Archaic to Hellenistic Abdera that demonstrate a promising field to investigate the re-engagement with the dead in post-funeral circumstances that may or may not be identified as ritual.

5 **REUSE AND RECYCLING OF MATERIALS IN ROMAN AND LATE ANTIQUITY: AN OVERALL VIEW**

**Abstract author(s):** Acero Pérez, Jesús (Centre of Archaeology at the University of Lisbon - UNIARQ; Fundação para a Ciência e a Tecnologia - FCT)

**Abstract format:** Oral

In 2000, archaeologist Emilio Rodríguez-Almeida argued that the practice of reuse and recycling had turned classical Rome into a “self-cleaning” city. Although this consideration may be excessive, it highlights the fact that cities in Antiquity easily “absorbed” a lot of the waste generated in them, minimizing the amount of rubbish and debris that definitely passed into the archaeological context.

In this paper we present an overview of the practice of reuse and recycling during the Roman and Late Antiquity, analysing its different modalities according to the type of material: metallic and glass artefacts, pottery, building materials, wooden furniture, textiles and even other matters such as excreta, urine and water.

Classical and Late Antique culture, like the rest of pre-industrial societies, were characterized by a maximum optimization of available resources and materials. In this context, the practice of reuse and recycling constitute, essentially, economic measures, which benefits the domestic economy and the productive agents. The generalization of these practices demonstrates their profitability even in times of economic prosperity, although, logically, they are intensified in periods when the difficulties in obtaining new merchandise and raw materials are more pronounced.

268 **RHYTHMS, ROUTINES AND REPETITION AGAINST CULTURE: THE EMERGENCE OF SOCIAL IDENTITIES IN SHARED EVERYDAY PRACTICES, FOOD STRATEGIES AND LIFESTYLES**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Kvetina, Petr (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Bickle, Penny (Department of Archaeology, University of York) - Trampota, Frantisek (Department of Archaeology and Museology, Masaryk University)

**Format:** Regular session

This session asks how social integration and identity in the Neolithic and post-Neolithic periods are revealed through small-scale interactions and the everyday routines of life. Both traditional archaeological methods and some more recent scientific analytical techniques (e.g. tracing migrations of human populations using aDNA etc.) rely on the cohesion of past social units to frame the scale of study. This leads to archaeologists ascribing certain identities to diverse human populations based on a general unity of material culture or common genetic signatures. In contrast, anthropological research in living communities suggest that large-scale social groupings are to some extent “fictive”, built up of multiple and diverse identities and variations in practice. Such mass social entities (normally called cultures) are (ab)used in interpretative narratives creating histories which focus on the culture acting as



a whole – or agency is placed in the hands of certain actors (such as the elite, males, etc...). This approach thus neglects social interaction in non- or loosely-stratified societies, which is small-scale and based on a common habitus, food traditions, everyday practices and shared cosmologies/mythologies. Generalizations in the form of archaeological cultures are then hard to sustain as explanatory mechanisms in narratives of change, but what is the impact of this on our use of archaeological cultures as analytical frameworks in long-term histories?

Our goal is to bring together scholars from different areas of archaeology and bioarchaeology to debate how we can uncover these small-scale interactions and habitus from integrating material culture, architecture and the burial record with the evidence from bioarchaeological techniques, such as isotopes, aDNA and lipid analysis. We invite papers connecting these data based forms of evidence, such as distribution patterns of various aspects of material culture, diet composition reconstructions based on stable isotope analyses, dental microwear, studies of short-range mobility and so on.

## ABSTRACTS

### 1 INTRODUCTION: RHYTHMS, ROUTINES AND REPETITION AGAINST CULTURE

**Abstract author(s):** Bickle, Penny (Department of Archaeology, University of York) - Kvetina, Petr (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Trampota, Frantisek (Department of Archaeology and Museology, Masaryk University)

**Abstract format:** Oral

Archaeological evidence resonates at varied scales of analysis, from continent wide to the small scale and the everyday. In this introduction to the session, we ask how we can create interpretative frameworks that allow us to study social organisation and identity at different scales. The notion of archaeological cultures encourages region-wide statements, often driven by the desire to understand the long-term and the wide-spread. Here, we argue that equally important understandings of the past can come to the fore at different scales, importantly challenging discourses on the dominance of certain power forms in the past. To illustrate these debates, we will draw on recent isotope work from the context of the Linearbandkeramik (LBK; 5500-5000 cal BC) and post-LBK Neolithic periods in central Europe. Can wide spread patterns be inferred from select case studies? Do values that represent lifeways at the scale of the lifetime adequately capture the variety of early farmer routines and rhythms?

### 2 RESEARCH PROJECT “LIFESTYLE AS AN UNINTENTIONAL IDENTITY IN THE NEOLITHIC”: IDEAS, CONCEPT, DATA

**Abstract author(s):** Trampota, František (Institute of Archaeology and Museology, Masaryk University)

**Abstract format:** Oral

The aim of the paper is to introduce the basic theses of the project, its partial results and its direction.

The current problem of archaeology is the theory through which the archaic human society can be explained. This paper shows possible understanding of the Neolithic societies without the need to use categorical terms such as ‘archaeological culture’ and the assumption of sharply bound social entities. The research project is generally inspired by the theory of the polythetic structures of human society (D. Clarke 1968) and aims to study the lifestyle of people on the basis of various archaeological and anthropological variables. These include reconstruction of diet, reconstruction of distribution networks of stone tools, distribution of symbolic systems according to principal features of pottery decoration, morphological characteristics of stone axes and characteristics of the settlement structures.

The project focuses on two separate settlement macro-structures, the Morava river basin (Moravia, Western Slovakia, Northern Lower Austria) and the eastern half of Bohemia. The chronological span of interest is the interval from post-LBK to TRB (4900-3300 BC), a period that is initially characterized by the collapse of a large social structure (LBK), which goes through several major changes in all aspects studied.

### 3 HOW ARE NEOLITHIC RONDELS RELATED TO THE CONCEPT OF ARCHAEOLOGICAL CULTURES?

**Abstract author(s):** Ridky, Jaroslav - Květina, Petr (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague)

**Abstract format:** Oral

The paper is focused on the spread of circular architecture, so-called rondels, which consist of circular V-shaped ditches with inner concentric palisade trenches, interrupted by two to four entrances. Rondels are dated to the late Neolithic (central European chronology), to a relatively short time span of approximately 4850–4700 cal. BC. About two hundred rondels are presently known, located in the geographical area of four main archaeological cultures in Central Europe. The archaeological record of each of the cultures demonstrates both independence and interconnectivity. There are differences in house layouts, in evidence and presence of storage features, and also in burial practices, to name just a few. However, the distribution of some artefacts, such as ceramic vessel shapes and stone tools made of specific raw materials, interconnects this large area. The question is the purpose of existence of such circular architecture, with similar size groups and probably also construction traditions, in four “different worlds”. Were they just ritual arenas for trans-egalitarian societies, ritual meeting places for special occasions, or can we talk about temples of more complex societies?

### 4

### DIETARY HABITS AND NEOLITHIZATION IN THE CENTRAL BALKANS THROUGH DENTAL BUCCAL-MICROWEAR AND ISOTOPE ANALYSIS

**Abstract author(s):** Markovic, Jelena (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Jovanovic, Jelena (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade; BioSense Institute, University of Novi Sad) - de Becdelièvre, Camille (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Stefanovic, Sofija (BioSense Institute, University of Novi Sad, Serbia; Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Romero, Alejandro (Department for Biotechnology, Faculty of Science, University of Alicante)

**Abstract format:** Oral

The Neolithic Transition in Europe has been associated with major migrations and sweeping changes in subsistence practices, lifestyle, social structures and demographic patterns. Nonetheless, some recent studies emphasize regional specifics or temporal differences in this process and put forward the role of environmental variations and the influence of indigenous forager traditions, as explanations. The Central Balkans is one of the key regions for studying Neolithization processes since there is documented coexistence of last hunters and first farmers. In particular, Early Neolithic foragers’ and farmers’ contemporaneous sites are located in two different but close-by environments: the Danube Gorges with continuous Mesolithic-Neolithic occupation (9500-5500 BC), and the Great Pannonian Plain where evidence for Mesolithic presence is circumstantial, but where the Early Neolithic is associated with an exploding number of sites (6200-5200 BC). This context provides a particular scenario to explore foragers’ and farmers’ dietary behaviors from different social, cultural and natural environments. In this study, we analyzed 70 postcanine buccal-microwear from individuals of different chronological populations to characterize the effect of dietary abrasiveness and the impact of food processing techniques. Buccal-microwear patterns were then cross-linked with previous radiogenic and stable isotope signatures, which provide information about migration and the protein content of the diet. By comparing different lines of bioarcheological evidence, our findings provide unique insights into patterns of subsistence adaptations and the cultural transmission of dietary habits in this region. The spread of the Neolithic likely included the adaptations of ways of subsistence, food preparation and consumption, to local natural and social environments. Concerning regions already populated by foragers, the results also confirm that Neolithization should not be seen as a straightforward process of acculturation but rather represents more complex behavioral and cultural interactions and transmissions.

### 5

### POST-MARITAL RESIDENCE PATTERNS IN EARLY NEOLITHIC CENTRAL EUROPE: MODELS BEYOND THE BIOARCHAEOLOGY

**Abstract author(s):** Hrnčíř, Václav - Kvetina, Petr (Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague) - Vondrovský, Václav (University of South Bohemia)

**Abstract format:** Oral

Many contradictory opinions on post-marital residence rules in society of the first farmers in European temperate zone has been proposed. Traditionally, matrilocality and matrilineal kin relations were assumed to be characteristic of the Early Neolithic populations (Linear Pottery Culture, LBK, ca. 5500–4900 cal BC). Currently, however, the hypothesis of patrilocality and community exogamy prevails. This opinion is based primarily on the results of strontium isotope analyses and supported by other kinds of evidence (e.g. genetic, linguistic or anthropological). However, ethnographic literature show that post-marital residence rules were often complex and cannot be summed up into a simple dichotomy patrilocality / matrilocality. Using two case studies, LBK cemeteries of Vedrovice (Czechia) and Nitra (Slovakia), we will attempt to show that other interpretations of the same strontium data are possible. We argue that several aspects could affect isotope results in these LBK datasets, including possible practice of polygyny, abduction of young women, and non-inhumation burials. We will also discuss the issue of non-localized parts of social identity, which do not necessarily overlap geographical space, and propose hypothetical model combining different post-marital rules on different social levels.

### 6

### URBANIZING FOOD: GROUND STONE IMPLEMENTS AND THE SOCIAL PERCEPTION OF FOOD PROCESSING IN THE EARLY BRONZE AGE I-III SOUTHERN LEVANT

**Abstract author(s):** Hruby, Karolina - Rosenberg, Danny (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa)

**Abstract format:** Oral

Urbanization developed differentially throughout history, reliant on social, economic and environmental conditions. In the southern Levant, the initial stages of this process differ considerably from the Mesopotamian and Egyptian precursors; the emerging regional urban centers are smaller and seemingly less organized and structured, suggesting a limited presence of administration and authority control, and inconsistencies in the “urban package” they deliver.

One of the major features of urbanization is the growing need for food in the face of population growth and condensation. Surplus food procurement secures the well-being of urban and adjunct communities in the situation of poor harvest or crisis. This creates the need to control agricultural yields, storage, food production and distribution, and supports the development of specialization and social divisions. The major change in the social fabric and food procurement imposes adjustments in food processing and storage techniques and creates significant differences in economic strategies between the Early Bronze Age villages and the early urban centers that appeared for the first time in the southern Levant during this time span.

7

COOKING POTS, FOOD AND SHARED ORDINARY PRACTICES

**Abstract author(s):** Lymperaki, Marianna - Urem-Kotsou, Dushka (Democritus University of Thrace) - Kotsos, Stavros (Ephorate of Antiquities of Thessaloniki City)

**Abstract format:** Oral

The act of sharing food on a daily basis is an essential element of daily practices that contributes to the creation of strong psychological ties between individuals, thus strengthening the social integration of groups that share daily meals. Cooking pots and the food cooked in them, along with the location of cooking facilities can provide valuable insight into the ordinary culinary practices and are thus a powerful tool for better understanding the way the food preparation and commensality shapes the social relations within Neolithic communities.

This presentation focuses on cooking pots and the spatial distribution of cooking facilities at the Neolithic settlement of Stavroupoli in Thessaloniki (Northern Greece). The size and shapes of cooking pots is used as a proxy for the size of the group that shared cooked food and the cooking techniques applied in the preparation of meals. The location of cooking facilities in relation to houses is taken as an indication of the role of the preparation of food in forming social relationships. Results of chemical and microbotanical (starch and phytolith) analysis of food remains in cooking pots provide further insight into the role of domestic preparation and consumption of food.

8

LIFESTYLE OF LATE NEOLITHIC AND EARLY ENEOLITHIC POPULATIONS FROM MORAVIA AND EASTERN BOHEMIA (CZECH REPUBLIC) BASED ON BIOARCHAEOLOGICAL RECORDS

**Abstract author(s):** Tvrdý, Zdenek (Anthropos Institute, Moravian Museum, Brno) - Jarošová, Ivana (Freelancer in anthropology) - Drtikolová Kaupová, Sylva (Department of Anthropology, National Museum in Prague)

**Abstract format:** Oral

Post-LBK Neolithic and Early Eneolithic period (cca 4900 – 3500 BC) in Moravia and eastern Bohemia (Czech Republic) is in classic archaeological conception represented by Stroked Pottery culture (SBK), Lengyel culture (LgC) and Funnel Beaker Culture (TRB). The aim of this study is to compare bioarchaeological data of the populations from separate areas and periods to find patterns in possible differences in their lifestyle and diet composition.

Basic demographic (sex, age) and metric (body stature) data of over 150 individuals together with dental health analysis (caries frequency, tooth wear, periodontal disease) provide the framework for the subsistence strategy and/or social status analysis. Data from buccal dental microwear analysis and stable isotope analysis (carbon and nitrogen) of bone collagen represent important source for reconstruction of dietary habits which tend to evolve and change in the defined area and period. The results of these analyses provide insight into social integration and identity in the later Neolithic and early Eneolithic.

a.

VARIATION IN THE SHAPE OF POLISHED STONE AXES AS A RESULT OF SMALL DECISIONS WITHIN BORDERS OF SHARED MANUFACTURING PRACTICE

**Abstract author(s):** Pajdla, Petr (Department of Archaeology and Museology, Masaryk University)

**Abstract format:** Poster

The manufacturing process of axes, adzes and other neolithic polished stone tool implements is, in comparison with the manufacture of lithic stone tools or pottery vessels, a lengthy one. The process comprises of many small decisions that end up embodied in the final form of the artefact. These decisions are on the one hand of technological nature, influenced by the irregularities of raw material or experience of the artefact creator and on the other hand subject to the manufacturer’s creativity and innovation.

Despite many points of small decisions in the manufacturing process where a substantial variation of the final form can originate, various types of polished stone tools show a great deal of similarity in space and time. This speaks for a shared idea of both the final shape the artefact takes and the manufacturing practice itself.

Employing formal shape analysis allows us to assess the degree of similarity of polished stone tools and to identify possible irregularities in the observed distribution patterns. The poster presents a case study from the Neolithic period in the Czech Republic, where variation in the shape of polished stone axes is examined and the reasons behind this variation are explored based on deviations in shared manufacturing practices.

ARCHAEOLOGY OF THE EARLY MODERN COLONIAL LIMES

**Theme:** 2. From Limes to regions: the archaeology of borders, connections and roads

**Organisers:** Marin-Aguilera, Beatriz (University of Cambridge) - Escribano-Ruiz, Sergio (Euskal Herriko Unibertsitatea / University of the Basque Country)

**Format:** Regular session

‘Good fences make good neighbours’, the proverb goes. Frontiers are generally understood as cultural, religious, language, and societal divides. Yet, through history, frontiers were imagined and manufactured for people to cross them. Borders did not only separate people, but did also connect them. Similar to the Roman limes, early modern boundaries put in contact what it was considered as ‘civilised world’ with the ‘savage/infidel world’. Still, people lived on, through, and against borders; and in turn, frontiers shaped people and trans-regional connections. Material culture played a crucial role in the construction of frontiers, especially in the so-called ‘Age of Exploration’ when Europeans searched for new trade routes that would fuel capitalism in their continent and, in the process, colonised large parts of the world. The materiality of borders took place in the form of walls, fortifications, religious buildings, city-plans, prisons, and cemeteries; but also in the form of body-adornment and apparel, food and crops, weapons, labour equipment and tools, and sacred objects. This session looks at those in-between objects that shaped and challenged people and frontiers alike between 1400-1800 AD by exploring African, American, Asian, European, and Pacific contexts. We welcome theoretical and methodological papers exploring the material culture of making and unmaking political, racial, sexual, and confessional boundaries in the early modern colonial world.

ABSTRACTS

1

POROUS BARRIERS: HUMAN SECURITY IN TWO 18TH CENTURY CONTEXTS

**Abstract author(s):** Carman, John (Ironbridge International Institute for Cultural Heritage, University of Birmingham)

**Abstract format:** Oral

The preservation of territorial integrity against aggression in the 17th and 18th centuries in Europe was frequently considered to lie in the maintenance of fortresses that lay scattered throughout the territory of areas between potential enemy territories. The idea of the fortress as the provider of protection was also adopted elsewhere by Europeans, and so forts were constructed throughout the territories of north America claimed by both France and Britain. But here, in particular areas, greater reliance was placed upon the nature of the landscape as ‘impenetrable wilderness’. In the first case, seizure of the barrier fortresses by an aggressor might require a major war that could engulf all of Europe to restore a territorial security which was never entirely achieved. In the second, while forts remained important, they could and were regularly bypassed by the passage of military forces through the supposed wilderness.

Taking as examples the Dutch border fortresses in Europe and the Mohawk Valley in upstate New York, this paper will compare these two approaches to frontier management in an era before the full invention of the nation-state and its mutually-agreed ‘hard’ border. Drawing upon ideas of border areas as ‘third spaces’ and the concept of ‘human security’ applied in Critical Security Studies the role of local inhabitants will be emphasised.

2

NOT A LIMES BUT ALL. THE FUTILITY OF FRONTIERS IN NEWFOUNDLAND DURING EARLY MODERN AGE

**Abstract author(s):** Escribano-Ruiz, Sergio (University of the Basque Country - UPV/EHU)

**Abstract format:** Oral

The expedition led by John Cabot in 1497 was the starting point of the European colonization of Canada. Soon after its arrival, several Portuguese expeditions explored the Canadian coast. There is evidence of several French campaigns around the same time in the Newfoundland fisheries, led firstly by sailors from Normandy and then from Brittany shortly after. Although certain historiography has attempted to argue to the contrary, there is every indication that the Basque sailors arrived in Canada a little later, by the first decades of the sixteenth century. In spite of their “discovery”, English involvement in fishing in Newfoundland was very sporadic until the late sixteenth century. In contrast to what occurred further south, no European country was determined to claim Newfoundland and to establish permanent settlements. Therefore, Canadian fishing waters were freely accessible to Portuguese, French, English, Spanish, Irish, and Dutch sailors, some of which interacted with several native groups. Therefore, until the frontiers were legally established by the Treaty of Utrecht in 1713, Newfoundland was a neutral ground in which people and things from manifold origins converged in their search of local resources. In this presentation, we will explore on the one hand, how the absence of frontier conditioned, the material world of these international sailors. On the other hand, we will try going further considering how the concept of frontier could be applied to the First Nations and their material practices.

3

BRIDGING TWO WORLDS: COLONIAL WALL PAINTINGS FROM CHAJUL (GUATEMALA) AND THEIR SIGNIFICANCE FOR LATIN AMERICAN ART AND CULTURE

**Abstract author(s):** Zralka, Jaroslaw - Radnicka, Katarzyna - Banach, Monika (Jagiellonian University) - Maciej, Arkadiusz - Velasquez, Juan Luis (Proyecto Conservación de los Murales de Chajul) - Vazquez de Agredos-Pascual, Maria (University of Valencia)

**Abstract format:** Oral

Two different worlds are represented on the rare wall paintings uncovered recently in several houses belonging to indigenous people of Central America, the Ixil Maya. The individuals wearing European clothes face others, dressed in elaborate costumes that most likely are the indigenous attires.

The paintings may feature local dances or rituals but what is certain is that they depict a mixture of pre-Columbian and European elements. It has been documented that dances – like those possibly depicted on mural paintings – have been played on the patios of the houses in Chajul, some of them dedicated to specific spatial order. Again, two worlds recreated in a colonial structure, but embedded in the indigenous conception of space.

Chajul itself is a place where these boundaries between the two worlds are in constant interplay. It is believed that the Catholic Church flips its façade depending on which canton prays, a reminder of congregations, a forced resettlement and concentration of indigenous communities in the 16th century. This memory contained in oral history has been preserved among the inhabitants and continue to play important role in the production of the local identity.

The Chajul murals escape the canons of Colonial art (which is mostly focused on Christian religious themes and painted in public buildings rather than private houses) but are also difficult to compare to the earlier indigenous art. This paper attempts to answer the question about the meaning of the boundaries between the two worlds represented in the paintings, but also bring closer the issue of how these temporalities are represented in a multivocal place such as Chajul. The results of our study presented in this paper is based on the interdisciplinary research that combines archaeology, history, history of art, cultural anthropology as well as physico-chemical data.

4

BUILDING FRONTIERS: DISCOURSES AND PRACTICES

**Abstract author(s):** Marin-Aguilera, Beatriz (University of Cambridge)

**Abstract format:** Oral

Chile was the most remote frontier of the Spanish Empire in the Americas (1550–1818), in which colonial power and indigenous resistance were contested over centuries. Famous for their fierce resistance, the Reche-Mapuche defeated the Incas and the Spaniards alike. As a mixture of pride and political strategy, many European powers tried to conquer the Reche-Mapuche to get access to Peru, among them the Dutch and the British. However, their attempts were similarly unsuccessful as soon as they mentioned their interest in gold. Removed from the empire’s core, Reche-Mapuche communities shaped a very dynamic and productive colonial borderland that also functioned as a material crossroad between the Spaniards, the Dutch, the British, and other local communities. This paper explores the continuous reshaping of colonial frontiers through political and social struggles in the area of Valdivia. I do so by focusing on daily life objects that built imperial and resistant practices, creating hybrid performances.

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INTEGRATING HARD DATA IN THE INTERPRETATION OF MEDIEVAL ARCHAEOLOGY. EXAMPLES, ISSUES AND PERSPECTIVES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Hlad, Marta (Vrije Universiteit Brussel, Maritime Cultures Research Institute) - Magdič, Andrej (Institute for the Protection of Cultural Heritage of Slovenia, Research Institute) - Milosavljević, Monika (University of Belgrade, Faculty of Philosophy, Department of Archaeology)

**Format:** Regular session

New scientific methods such as aDNA and isotope analysis triggered the third scientific revolution in archaeology (sensu Kristiansen 2014) and are now seen as a panacea that will solve all archaeological problems. More often than not, the interpretations of scientific data issued from these methods stop at the very basic level, leaving the bigger archaeological questions unanswered.

For example, when we conduct an isotope analysis of skeletal remains to infer diet, papers often conclude that different groups of people had different protein intake, but these findings do not get embedded into a broader context of what we know about the studied society. The amount of data now available to a contemporary medieval or post-medieval archaeologist is bigger than ever. This often leads to an intuitive approach and eclectic use of theory. How should a medieval archaeologist come about this gap between data-driven and theory-driven research? How does one overcome the difference between hard science and social science epistemologies? What kind of interpretation strategies would lead us to better understand the narratives related to political, economic, demographic and ecological changes, and the construction of metanarratives?

The focus of this session is to connect scientific data and knowledge-based storytelling. The contributions to this session can include:

- Examples of good practice in terms of integration of archaeological science and theoretical concepts relevant to medieval and post-medieval archaeology.

- Issues such as communities and communal identities, interrelations of nature and culture, life course, memory studies, social change, social stratification, human-animal relations, human remains and bodies, systems thinking, landscape approaches, big data, and written sources related to these topics and approaches.
- Discussion on future perspectives and challenges on the quest for metamodernism.

ABSTRACTS

1

INTEGRATING HARD GEOARCHAEOLOGICAL DATA INTO INTERPRETATION OF KEY THEMES IN MEDIEVAL ARCHAEOLOGY

**Abstract author(s):** Banerjea, Rowena (University of Reading)

**Abstract format:** Oral

Geoarchaeology applies earth science techniques to archaeological research questions. This paper addresses three research strands in medieval archaeology to provide an overview of the application of geoarchaeological data to these lines of enquiry:1. Urban archaeology; 2. Landscape archaeology; and 3. Heritage management. Firstly, a case study from medieval Riga, Latvia, shows the importance of geoarchaeological data for understanding how the pre-Hansa town developed by examining, at high resolution, the occupation deposits within super-imposed buildings in the indigenous ‘Liv’ quarter. Secondly, the role that geoarchaeology plays in understanding frontier landscapes is examined in the eastern Baltic region in the context of the Northern Crusades, where religious transformation was imposed by force. The paper examines how the application of geoarchaeology to understand castles and their hinterlands is integrated with other environmental archaeological data and historical sources. Finally, the paper highlights the important role that geoarchaeological has to play in informing the heritage management decisions relating to the buried archaeology of European castle sites.

2

THE USE OF GIS TOOLS AND SYSTEMS THINKING IN LANDSCAPE RESEARCH OF THE EARLY MEDIEVAL MARCH OF PTUJ

**Abstract author(s):** Magdic, Andrej (Institute for the protection of Cultural Heritage of Slovenia)

**Abstract format:** Oral

The interpretation of the “ethnicity” of archaeological artefacts was one of the main topics of Slovenian early medieval archaeology since its beginnings in the early 20th Century. Despite the critique of the cultural-historical approach, introduced in archaeology by processualism, which clearly showed the problems and limits of interpreting ethnicity based on archaeological artefacts, it remains the main research topic in early medieval archaeology of North-Eastern Slovenia even in the beginning of the 21th Century.

In order to overcome this state of research I am proposing a GIS driven landscape approach, applied in the early medieval historical region of the March of Ptuj (marchia Pitouiensi), which laid on the Drava Plain and its surrounding hills in today’s North-Eastern Slovenia, with the centre in the town of Ptuj. With the correlation of archaeological, historical, building-historical and physiographical research results, new data about the early medieval settlement processes of the region were created. Different components of social systems, which were developed in the region through the early middle ages, could be defined with the method of “systems thinking”. The results of this methodological approach enabled new possibilities of interpretation of settlement processes, which would not have been possible by observing individual data sets by themselves.

This research is a partial result of the project »Settlement of the South-Eastern Alpine Area in the Early Middle Ages« (ID J6-9450), which is financially supported by the Slovenian Research Agency.

3

PROBLEMS AND OPPORTUNITIES OF GIS AS A RESEARCH TOOL IN (POST)MEDIEVAL ARCHAEOLOGY

**Abstract author(s):** Novakovic, Predrag - Predovnik, Katja (University of Ljubljana) - Mlekuž Vrhovnik, Dimitrij (Institut for the Protection of Cultural Heritage of Slovenia; University of Ljubljana)

**Abstract format:** Oral

Following the introduction of the first GIS applications to archaeology in the early 1990s, GIS almost immediately spread across all major domains of the discipline. However, if we focus on purely research aspects of GIS-based archaeology, and exclude its potentials in data management and integration for heritage management, it is evident that GIS studies were most numerous (and successful) in prehistoric archaeology. Historical (medieval and postmedieval) archaeology was the least successful in applying GIS as a research tool. GIS philosophy, and its research implementations, are based on a series of assumptions about human behaviour, which is seen as rational, patterned, and hence predictable. As such, it can be modelled using relatively coarse proxy-data or fragmented data sets on the environment, economy, settlement, social structure etc. This may not work well with data of much higher resolution and accuracy, characteristic for historical archaeology. For example, the economic activities and settlement patterns discerned from the tithe books, historical cadastres and other documentary sources provide a much more accurate image of the past than any GIS model can either describe or predict. This does not mean that GIS cannot be a very useful tool in our research, but it needs to be appropriately reconsidered. In our paper, we propose an approach which focuses on specific spatial behaviour in both archaeologically and historically well documented and contextualised situations. Military activities may prove to be particularly well suited to this approach which we will illustrate with our case study on local defence against the Ottoman raids in 15th- to 17th-cen-



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turey Slovenia.

### MORTALITY AND SURVIVAL IN MEDIEVAL CANTERBURY: STATISTICAL ANALYSES IDENTIFYING HEALTH OF INDIVIDUALS

**Abstract author(s):** White, Sina - Deter, Chris (University of Kent, School of Anthropology and Conservation, Skeletal Biology Research Centre)

**Abstract format:** Oral

Canterbury was a major pilgrimage city between the 11th to 15th century. This increase in population led the city to transform from a small rural town to a busy urban city. Urban areas in medieval England were thought to have dense living environments, inadequate sanitation, and unpredictable food supply that affected the lifestyles and health of the population. This research uses statistical methods to explore the relationship between health and urbanisation in medieval Canterbury. Ages at death, biological sex, and skeletal physiological stress markers from an osteoarchaeological analysis of St. Gregory’s Priory and Cemetery are integrated into statistical analyses as proxies for health. Cox proportional hazards model, Kaplan-Meier survival analysis, and risk estimate are used to recognise the risk of mortality between males and females and between individuals with and without skeletal indicators of physiological stress. The outcome from statistical analyses provides preliminary results on the effect of medieval Canterbury’s urban environment had on individuals’ health.
- 5

### ANALYTICAL TECHNIQUES IN THE TOOLBOX OF EARLY MEDIEVAL ARCHAEOLOGY: POTENTIAL AND LIMITATIONS. EXAMPLES FROM THE CRUMBEL PROJECT, BELGIUM

**Abstract author(s):** Hlad, Marta (Vrije Universiteit Brussel; Université Libre de Bruxelles) - Annaert, Rica (Vrije Universiteit Brussel) - Capuzzo, Giacomo (Université Libre de Bruxelles) - Veselka, Barbara (Vrije Universiteit Brussel) - Dalle, Sarah (Ghent University; Vrije Universiteit Brussel) - Sengeløv, Amanda (Université Libre de Bruxelles; Ghent University) - Vercauteren, Martine (Université Libre de Bruxelles) - De Mulder, Guy (Ghent University) - Snoeck, Christophe (Vrije Universiteit Brussel; Université Libre de Bruxelles) - Tys, Dries (Vrije Universiteit Brussel)

**Abstract format:** Oral

In 2018, the CRUMBEL project (Cremations, Urns and Mobility – Ancient population dynamics in Belgium) received funding to conduct four years of research on collections of cremated archaeological bone curated in various museums and institutions in Belgium. The project aims to apply recently developed analytical techniques on cremated bone from the Neolithic to the Early Middle Ages in Belgium, as well as develop new approaches to the study of cremated bones, which are generally understudied in archaeology.

Even though cremation was not a dominant funerary rite in Belgium during the Early Middle Ages, cremation burials are present in several cemeteries up until the mid-7th century AD in certain regions, such as the Scheldt river valley. There are a number of issues to explore about these cemeteries, such as the coexistence of inhumations and cremations related to mobility and migration, continuity vs. discontinuity from the Roman period, the actual duration of cremation, as well as identity of the people who practiced these different funerary rites.

This presentation will focus on the potential of the various analytical techniques employed in the CRUMBEL project (isotope analysis, infrared spectroscopy, radiocarbon dating) to answer questions relevant to the early medieval period in Belgium. The focus of the discussion will be on the potential of these techniques to contribute to the current debates, as well as their limitations.
- 6

### HOW TO TRACE AND DESCRIBE SOCIAL DEVELOPMENTS IN EARLY MEDIEVAL SOCIETIES BASED ON ARCHAEOLOGICAL SOURCES? THE CASE STUDY OF CARANTANIA

**Abstract author(s):** Eichert, Stefan (Natural History Museum Vienna)

**Abstract format:** Oral

Archaeologists often deal with social structures, social changes and the formation of societies based on material sources respectively “hard data” that are derived from archaeological finds and features. E.g via isotopic analyses, radiocarbon dating or physical-anthropological determinations. The terms used for a social interpretation of these sources are often clearly defined terms from social sciences such as cultural anthropology or sociology. However they are not always used properly. E.g terms like rank and class are mixed up even though they have different, sometimes contradictory meanings in social sciences. The proposed paper wants to discuss the development of the Eastern Alps from the 7th until the 9th century focusing on the formation of communities resp. societies within the framework of Niklas Luhmann’s systems theory. Another topic will be the discussion of various types of leadership that can be traced through written and material sources based on the concepts of “great men”, “big men” and “chiefs”.

- 7

### QUESTIONS FROM THE HEART OF THE FIRE: USING STRONTIUM ISOTOPES TO EXPLORE HUMAN-ANIMAL RELATIONSHIPS AT A VIKING CREMATION CEMETERY

**Abstract author(s):** Loeffelmann, Tessi (University of Durham) - Claeys, Philippe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel, AMGC-WE-VUB) - Montgomery, Janet (University of Durham) - Richards, Julian (University of York) - Snoeck, Christophe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel, AMGC-WE-VUB; G-Time Laboratory, Université Libre de Bruxelles)

**Abstract format:** Oral

Most funerary evidence for a Viking presence in Britain occurs in the form of inhumation burials and only one cremation cemetery from this period has so far been discovered in Britain: the barrow cemetery at Heath Wood, Ingleby, in Derbyshire. This cemetery consists of fifty-nine known burial mounds of which a small number have so far been excavated to reveal cremation deposits (Richards 2004). Crucially, the cremated remains do not solely include humans, but also animals. This was a common practice during the early medieval period and has been theorised frequently in academic circles. However, what happens when we use ‘hard data’ to approach this question, and what can we do with the results beyond stating the mere ‘facts’? Using strontium isotope analysis of the cremated remains from Richard’s 1998-2000 excavations of two barrows on the site, this paper will explore the indications of the ‘hard data’ and try to imbue them with a meaningful, albeit considered theoretical approach.
- 8

### IS A FISH ALWAYS A FISH? PERSPECTIVES FROM PREHISTORIC AND MEDIEVAL ARCHAEOZOOLOGY

**Abstract author(s):** Živaljević, Ivana (BioSense Institute, University of Novi Sad)

**Abstract format:** Oral

Ever since archaeozoology was incorporated into standard archaeological practice, the study of animal remains from archaeological sites has fluctuated between empirical and interpretative approaches. Given its biological and zoological roots, archaeozoology is bound to perceive animals as “organisms” - in order to identify, compare, and measure their skeletal remains as scientific objects. If an animal is always an animal, and a bone always a bone, the archaeozoologist is solely expected to provide their specialist knowledge and shift seamlessly from assemblage to assemblage, one cultural context to another. On the other hand, the development of constructivist approaches in archaeology has led to an understanding of human-animal relationships as culturally specific and highly contextual, ultimately avoiding any form of essentialism. Finally, the recent paradigm shift in the understanding of human and non-human relations as inherently social and mutually impactful (“the Animal Turn”) has moved beyond the polarising organism/construct view altogether. I here explore the relationship of the analyst and the archaeozoological record by discussing two fish faunal assemblages, fairly similar in terms of taxonomic composition (and sharing the same analyst!), but originating from vastly different contexts. The first assemblage originated from the Mesolithic-Neolithic (c. 9500-5500 cal BC) sites in the Danube Gorges, and the second from 13th-15th century kitchen middens at the Medieval monastery Studenica in Serbia. In accordance with particular research questions, concepts and theoretical frameworks specific to prehistoric and Medieval archaeology, the interpretation of the former drew heavily from hunter-fisher-gatherer relational ontologies, whereas the latter was centred on the elite status of the consumers and the role of imported fish as a commodity. I argue that the understanding of a „universal fishness” (or the lack thereof) greatly influences how we, as analysts, approach human-animal relationships in the study of prehistory, the Medieval period, and in archaeology in general.
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### THE ZOOARCHAEOLOGY OF THE BALTIC CRUSADER STATES: DATA AND THEORY

**Abstract author(s):** Pluskowski, Aleks (Department of Archaeology, University of Reading)

**Abstract format:** Oral

From the end of the 12th century, crusading armies unleashed a relentless holy war against the indigenous pagan societies in the Eastern Baltic region. Native territories were reorganised as new Christian states (Livonia and Prussia) largely run by a militarised theocracy, dominated by the Teutonic Order. The new regime constructed castles, encouraged colonists, developed towns and introduced Christianity, incorporating the conquered territories into Latin Europe. It subsequently conducted an ongoing war against the pagan Grand Duchy of Lithuania, which knights from across Europe participated in. At the same time, the theocracy sought to maximise the exploitation of natural resources to sustain its political and military assets, as well as provision its subjects. One of the most important resources was represented by animals, which were exploited for a range of primary and secondary products. Excavations across the eastern Baltic have uncovered tens of thousands of faunal remains from archaeological contexts on either side of the crusading period. This represents a substantial dataset which, when combined with more focused isotopic and genetic analyses, alongside palaeoenvironmental and historical sources, reveals how the new regime appropriated and intensified existing livestock husbandry practices, whilst accentuating earlier trends in declining biodiversity. But to what extent can theoretical frameworks, such as postcolonialism and resilience theory, contribute to a more nuanced understanding of these trends?

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Da Vela, Raffaella (Universität Tübingen, SFB1070 ResourceCultures, Institut für Klassische Archäologie) - Franceschini, Mariachiara (University of Freiburg) - Mazzilli, Francesca (Cambridge Archaeological Unit, University of Cambridge)

**Format:** Regular session

Several network approaches in archaeology focus on the interaction between settlements and territories, using natural driven resources (water, stone, clay, etc.) as data and underlining their role in linking places. This session proposes an inverse perspective on the relationship between networks and resources, discussing how natural and social networks constitute itself a form of immaterial resources. Both kinds of networks are strictly entangled, thus their reciprocal and lively interaction creates new socio-natural structures. We invite contributions analyzing the following networks jointly or separately, based on archaeological, environmental, topographic and/or epigraphic data across the Mediterranean and beyond. They focus on the narrative of the past shaped by multiple interlinked factors, such as socio-economic, political, religious, and environmental ones.

1. Dynamic and longitudinal networks:  
Topography plays an active role in the formation and organization of social structures, and vice versa humans mould natural networks in their favour: How does this interaction work as a resource?  
  
Adaptation or development of economic networks is linked to political changes: Did the integration of settlements in a political system affect the production and the circulation of goods? What was the impact of networks of patronage and political affiliation on local economies?  
  
The network of exchange of goods became a resource while causing changes and improvements in material culture: Did cultural contacts and personal mobility affect local communities?
2. Multi-layered and interlocked networks:  
Sacred landscapes and religious networks as resources for the construction of cultural identities: Can the sharing of cult practices be assumed as a proxy for the construction of local identities?  
  
Social networks and kinship as political and economic resources: Did local actors apply network strategies to maintain or to improve their power?  
  
Network of knowledge as resource of innovation: Did the transmission of know-how and the mobility of craftsmen build communities of practice?

ABSTRACTS

1. NATURAL AND SOCIAL NETWORKS AS A RESOURCE FOR POTTERY WORKSHOPS: METAPONTO CHORA IN CLASSICAL AND HELLENISTIC PERIODS AS CASE STUDY  
**Abstract author(s):** Tomei, Francesca (University of Liverpool)  
**Abstract format:** Oral  
  
Wasters, kiln technology and firing process have been largely studied as key features of pottery production, but a wider analysis of kilns locational choices in relationship with environmental and social landscape is needed to better understand pottery production in Classical and Hellenistic period.  
  
In this paper, I am investigating how kiln sites identified in the chora of Metaponto related with their broader landscape settings. Combining geospatial analysis through GIS with archaeological and ethnoarchaeological data, I focus on how pottery kiln sites fit in their local natural and socio-economic landscape in consideration of their spatial location and products manufactured. Indeed, workshops needed a range of natural resources to make and fire pottery (mainly clay, water and fuel) which must be available in the closest area, according to what topography, geology and geomorphology offered. At the same time, pottery was addressed for human use, so in the Greek countryside workshops should be located at a close distance to settlements/sanctuaries and roads, to facilitate short-distance trade.  
  
the high quality of archaeological data available after 40 years of researches of the Institute of Classical Archaeology of the University of Texas Austin in the chora of Metaponto allows me to analyse how natural and social networks can be a resource for pottery manufacturing in a Classical- Hellenistic Greek countryside.

2. BEYOND CONVENTIONAL BORDERS: TYPOLOGY OF CERAMICS AND THE FLOW OF KNOWLEDGE IN SOUTHERN IBERIA DURING THE EARLY BRONZE AGE  
**Abstract author(s):** Chala-Aldana, Döbereiner - Bartelheim, Martin - Diaz-Zorita Bonilla, Marta (SFB 1070 RessourcenKulturen, Eberhard Karls Universität Tübingen; Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhard Karls Universität Tübingen)  
**Abstract format:** Oral  
  
Typological analysis of pottery has been one of the traditional strategies in archaeology for categorising what is called the “material culture” of a human group. In most of the typological studies, archaeologists assign determined sets of ware to a “cultural group” and also generate maps or representations of the territories in which these sets were present. However, cultural-historical approaches have influenced these representations to the point of having specific typological entities for specific “territories.”  
  
This paper intends to reflect on the way archaeologists visualise “material culture” on maps, especially that of the Bronze Age in southern Iberia, a period where several social and cultural changes impacted people’s lives and ways of perceiving the landscape surrounding them.  
  
Typological entities are not just catalogues of sorted material belonging to groups with territories; they can also represent or reflect networks of relationships, where knowledge flew between sites and went beyond borders generated by archaeologists using conventional ideas of “index fossils” in order to assign sites to determined cultures or periods.  
  
Here, typological and petrographical analyses of Chalcolithic/Bell Beaker and Bronze Age pottery combined with GIS data give evidence of how our paradigms and contemporary ways of perceiving space affect the way we interpret the past. We present an alternative to the traditional way of interpreting pottery including new tools of analysis and cumulative approaches that could bring new ideas for the study of ceramics.
3. QUESTIONING AND REEVALUATING RELIGIOUS NETWORKS IN CLASSICAL ANTIQUITY  
**Abstract author(s):** Mazzilli, Francesca (University of Cambridge; University of Bergen)  
**Abstract format:** Oral  
  
Social Network Analysis (SNA) has enriched and continues to enrich the study of our past; however, it has been much more limited in the field of religion in Classical Antiquity. Although Greg Woolf has correctly raised some issues in the application of SNA to religion in the Classical world, the study of religious networks is remarkably growing. Starting with Anna Collar’s pioneering and ongoing investigation of the diffusion of specific cults across the Roman Empire (the Jewish Diaspora, the cults of Jupiter Dolichenus, Theos Hypsistos, Zeus Kasios and Syrian cults), a more recent project (GEHIR) has formalised modelling and computational simulations to also study the diffusion of specific cults (Isiac cults, Mithraism, Hellenistic Judaism and early Christianity). Two postdoctoral projects on religious networks at the University of Bergen have just been awarded a Marie Curie fellowship.  
  
This paper aims to reassess current and future directions of the study of religious networks in late Antiquity and their significance by emphasising how affiliative networks can help us providing a better understanding of the past as religion cannot be discerned from politics, society and people. Studies of religious networks undertake a bottom up analysis where networks are reconstructed through evidence of the cult of a deity and/or of a religious site identified as nodes. Although these nodes make these religious networks archaeologically visible, interactions of people or the lack of the latter, joint with a sense of belonging, contributed shaping these religious networks as key resources. While it may be easier to identify the network of the diffusion of a cult on the basis of written and archaeological evidence, its significance is enriched when correlating it with the people who worshipped these cults, based on their identification in inscriptions, through affiliative network analysis.
4. SACRED LANDSCAPES OF THE SOUTHERN GREECE FROM MYCENAEAN TO ARCHAIC TIMES: A COMPARATIVE APPROACH  
**Abstract author(s):** Vlachou, Afroditi - Salavoura, Eleni (Independent researcher)  
**Abstract format:** Oral  
  
The collapse of the Mycenaean palaces and the end of the Bronze Age led to the emergence of new communities, with different sociopolitical organization, new places of power, and new types of cult sites. The 8th century was certainly a turning point in the development of sanctuaries, introducing revolutionary practices mainly in the material expression of the religious belief. In some instances however older aspects of culture were clearly perpetuated and may have served to reinforce identity and legitimacy of position. The most long-lasting shrines were established close to routes of communication and in areas marginal to the palatial world.  
  
In this paper we examine shrines as linking places in the landscape of Southern Greece in a long durée approach. For that reason, we focus on small rural shrines, on sanctuaries on mountaintops, and on shrines founded on guarding passes and crossroads as landmarks for a wider region. On the one hand we attempt to locate examples where continuity of the cult and the preservation of a collective memory, which attributed religious and cult activity to the same sites, is evident through time. Examining the types of votive offerings, cult practices and rituals as repeated actions we’ll investigate whether this led to the formation of local and cultural identities over the centuries (13th-7th c. BC). On the other hand we consider the cases where the religious activity is interrupted or reshaped by changes of the socio-political conditions, the emergence of new networks of communication in Southern Greece and the formation of new central sites.

	<p>The study cases will shed light to the role played by some sanctuaries in the development of an enduring type of interaction and exchange in religious context, occasionally based on old traditions and acts firmly rooted in the heroic past.</p>
5	<p><b>NETWORKS OF CULT PRACTICES AS RESOURCES OF COHESION IN TRANSHUMANCE SOCIETIES OF THE APENNINE (6TH–1ST CENTURIES BCE)</b></p> <p><b>Abstract author(s):</b> Da Vela, Raffaella (SFB1070 RessourcenKulturen University of Tübingen)</p> <p><b>Abstract format:</b> Oral</p> <p>The present contribution approaches religious networks as resources to create social cohesion in transhumant societies of Pre-Roman Italy. These networks are constituted by natural and healing cults, open air sanctuaries and private cult practices and constitute the sacred landscape of transhumant communities. This is a fluid religious landscape, where the places of worship are small farms, huts, forests, lakes, rivers and springs rather than religious buildings.</p> <p>Main research questions address the function of religious networks in communities organized in sparse settlements in the mountain regions (vicatim) as well as the sharing of cult practices, imagery and myths as aggregative factors along and across the Apennine. The analysis has been conducted in two areas of the Apennine, where transhumance is archaeologically and ethnographically attested: Etruria in the North and Hirpinia in the South. The database consists of topographic data (positions of local communities and the diffusion of cult practices) as well as of the archaeological record (depositions of votive materials and typology of rituals and offerings). Through this comparison between geographic and cultural determined networks within the same chronology, it is possible to inquire the role of human ecology, landscape and cultural preconditions in constructing and managing religious networks. In this framework, networks of cult practices became cohesive resources for the maintenance of a common identity in geographically sparse and mobile communities of the Apennine region.</p>
6	<p><b>NETWORKS AND SOCIAL POWER IN ARCHAIC KAMIROS (RHODES, GREECE)</b></p> <p><b>Abstract author(s):</b> Bossolino, Isabella (Università degli Studi di Pavia/Université Paris 1 Panthéon-Sorbonne)</p> <p><b>Abstract format:</b> Oral</p> <p>The site of Kamiros, on the west coast of the island of Rhodes, was interested between the second half of the 19th cent. and the beginning of the Second World War by many archaeological projects, whose activities brought to light one of the best-preserved Hellenistic-Roman sites in Greece. In particular, the exploration of numerous funerary contexts contributed to partly understand the city life between the Bronze Age and the Hellenistic period.</p> <p>A crucial phase of Kamiros urban development was the transition from a disrupted and nucleated urban composition to the birth and consolidation of the actual polis. In such context, the burials of the Iron Age and the Archaic period can provide us with some fundamental data. Through the illustration and analysis of the contexts related to the period between the 10th and the 6th cent. BC, this talk aims to identify methods and processes that led to the configuration and development of dominant social groups. I will discuss how the choices in the deposition of grave goods and the modes of self-representation employed by the different social actors were strongly connected to the creation of medium and long range networks, implemented both from a temporal (control over the past) and spatial (contacts and relations with other Mediterranean cultures) perspectives. As already highlighted for crucial sites of the Greek world – i.e. Lefkandi, Eretria, Cuma – this presentation will illustrate the value of the creation and exhibition of networks in funerary contexts, in order to obtain and maintain a political predominance within the archaic society of Kamiros.</p>
7	<p><b>DANISH SITE, GOTLANDIC JEWELLERY, SLAVIC PEAS – AND WHO’S BURIED HERE? PLACING VIKING AGE BURIALS IN CONTEMPORARY NETWORKS WITH BIOARCHAEOLOGY</b></p> <p><b>Abstract author(s):</b> Palmowski, Valerie (University Tübingen; CRC 1070 ResourceCultures)</p> <p><b>Abstract format:</b> Oral</p> <p>The Viking Age was a time of transitions. The distribution of goods, individual mobility as well as the exchange of beliefs, knowledge and culture reached from Scandinavia to Byzantium, from Greenland to Russia. Few archaeological finds, e.g. a buddha figurine from Helgö (Lake Mälaren), even attest (in)direct contact with China. Ambitioned sea voyages transported persons, objects, cultural ideas and practices as far as L’Anse aux Meadows, Newfoundland. These pan-European and early global “interactions” (see archaic globalisation, Martell 2010) can be seen as networks, which established or continued shared concepts of value(s) between groups and regions.</p> <p>Bioarchaeology analyses the human actors within these networks. The closed context of burials, but also the skeletal remains of the body itself, preserve information on the specific position of a person during life (functional data) and in death (intentional data, Härke 1993). Aspects like the composition of grave goods, the type of grave construction and the childhood homeland, as well as accumulated traces of diet and pathologies reveal connections but also exclusions from sociocultural groups and mechanisms.</p> <p>“Foodways” (production, preparation, consumption and distribution of food) can, according to the definition of the CRC 1070 RESOURCECULTURES (Scholz et al. 2017), be defined as resource complexes, which include several actors, objects and immaterial means being entangled in a dynamic system. Their importance for the creation of identity has been stressed multiple times (Literature overview e.g. in Shah 2018).</p> <p>On the example of a selection of burial sites, individual diet, archaeological and osteological information are compared to discuss, if</p>

	<p>foodways were actively used to create identities and / or open societies up to intercultural contact in the Viking Age.</p>
8	<p><b>ITANOS (EASTERN CRETE): A GREEK CITY-STATE WITH A MEDITERRANEAN TERRITORY</b></p> <p><b>Abstract author(s):</b> Coutsinas, Nadia (Foundation for Research and Technology, Hellas - Institute for Mediterranean Studies - FORTH - IMS; CReA-Patrimoine, Université Libre de Bruxelles)</p> <p><b>Abstract format:</b> Oral</p> <p>Itanos is a Greek city-state situated at the extreme eastern tip of Crete. It is close to the Cape Sideros, ancient Samonion, a strategic crossing point, at the crossroads of the maritime routes of the Eastern Mediterranean.</p> <p>The city has always been in contact with Africa and the Eastern Mediterranean. It is thought to have been founded by the Phoenician Phoinix. And early historic connectivity between Itanos and Cyrenaica is highlighted by a story in Herodotus, thought to relate to events in the 7th century BC, when Korobios, a purple fisherman from Itanos, indicated to the Therans how to reach Lybia to found a new colony. The city has attested close political and economic contacts with Egypt, at least from the Hellenistic period onwards (when a garrison is sent by Ptolemy II Philadelphus), which can be seen in the material culture.</p> <p>As a coastal site and harbour situated at the easternmost part of Crete, Itanos was more easily connected to the eastern Mediterranean than to the rest of Crete. Its hinterland is just enough to sustain the inhabitants of the city. As such, the territory of Itanos remained much the same over the course of its history as the city did not need to expand inland.</p> <p>We will show that, as many coastal cities of Eastern Crete, Itanos would not have remained independent and survived through centuries without its Mediterranean connections. In fact, Itanos would not exist without its network, whose destruction, twice in Late Antiquity, had severe consequences for the city, leading to its final abandonment in the 7th c. AD.</p>
9	<p><b>RIVERS AS SOCIO-NATURAL NETWORKS IN ETRURIA</b></p> <p><b>Abstract author(s):</b> Franceschini, Mariachiara (University of Freiburg)</p> <p><b>Abstract format:</b> Oral</p> <p>“A history of water in general must deal with its material, political and ideological aspects” (Tvedt – Oestigaard 2010, 3). Thus, recent historical, anthropological, and ecological studies, analysing the influence of water on human socio-political changes, highlighted the need of a further consideration of the entanglement between social and riverine networks in ancient communities. Such a dynamic relation is based both on the consideration of waterways, valleys and archaeological remains, as well as on the flow of ideas, knowledge and phenomena, reflecting how human socio-cultural networks act and react to the riverine effectancy. The combination of these elements shows the relevance of the human-river entanglement, which can itself be seen as a resource affecting changes and enhancement for example in communication and settlement systems as well as in ritual and sepulchral local strategies. Shifting the analysis from microregional to global levels enables for clarification of how rivers act as trait d’union between broader networks, transcending political and ethnical borders and acting as conduits for the spread of cultural innovations. Reconsidering the network of the two basins of the Etruscan rivers Paglia and Fiora for the archaic and classical period I aim to emphasize the polysemy of river-networks. Considering the river basins as microregional geographical and cultural limits will allow a coherent analysis of the relationship between landscape and material culture. Focusing especially on the influence of the interaction between rivers and society on settlement and communication strategies, I want to illustrate in my paper how riverine networks can be understood as a resource, improving social and cultural mobility and affecting cultural history on a multiscale level.</p>
279	<p><b>NEOLITHIC AND BRONZE AGE TELLS AND THEIR NETWORKS IN THE CARPATHIAN BASIN AND BEYOND</b></p> <p><b>Theme:</b> 6. Embedded in European archaeology: the Carpathian Basin</p> <p><b>Organisers:</b> Pusztaine Fischl, Klara (University Miskolc) - Kienlin, Tobias (University Cologne) - Füzesi, András (Eötvös Lóránd University, Faculty of Humanities, Archaeological Departement) - Rassmann, Knut - Bánffy, Eszter (RGK)</p> <p><b>Format:</b> Regular session</p> <p>Based on recent archaeological research, the planned conference session seeks to address the European perspective on Neolithic and Bronze Age tells. The main focus will be on the emergence and abandonment of the tells of these two major prehistoric periods as functions of a particular geographical region. In addition to looking at the unique space/time dimensions of tells, our goal is to identify the shared traits of tells as well as to determine general trends and patterns based on various case studies. Another focus will be on how tells are embedded in the period’s networks and their multiscale relations, whereby we can broaden the overall contexts of their investigation and historic evaluation. In addition, we would like to provide a forum for multidisciplinary research and the potentials of geospatial applications. It is our hope that the proposed frameworks will provide fruitful discussions of the benefits of both the bottom-up and top-down approach as part of the session.</p>



**1** **TELL SITE OF THE LBC SZAKÁLHÁT CULTURE AT MEZŐKERESZTES-LAPOSHALOM (NE HUNGARY)**  
**Abstract author(s):** Pusztaine Fischl, Klara (University Miskolc) - Csengeri, Piroska (Herman Ottó Museum) - Hajdú, Melinda (Herman Ottó Museum) - Látos, Tamás - Pusztai, Tamás (Hungarian National Museum) - Tóth, Krisztián (Dornyai Béla Museum)

**Abstract format:** Oral  
North from the South-Borsod marshy area, at the junction of the Bükk Mountain and the Great Hungarian Plain, on the Bank of the Lator creek there is a Neolithic tell site: Mezőkeresztes-Lapos halom, until now unknown in archaeological research. The site was investigated with non-invasive methods (research in archives, aerial photography, surface survey, geophysics, soil drillings, GIS modelling) in 2019 and 2020. On grounds of the collected archaeological material the settlement belongs to the Szakálhát culture, which is one of the late groups of the Linearband Ceramic Culture in our territory. After the recent knowledge about Neolithic tells in the Carpathian Basin the Laposhalom site has two oddities: it lies remarkably north like the spread of other tell sites and its dating is too early to be a tell. The inhabitants of the site channelled the creek and created an artificial space around the encircled tell site. Our paper presents the results of recent research, analyses the inner structure of the settlement, puts it chronologically correct based on C14 dates and locates the site within the microenvironment and shows its place in the Middle and Late Neolithic settlement system.

**2** **CONTEXTS AND MODULES OF THE PHYSICAL AND SOCIAL DIMENSIONS AT THE LATE NEOLITHIC SETTLEMENT OF POLGÁR-CSÓSZHALOM**  
**Abstract author(s):** Csippán, Péter - Raczy, Pál - Füzesi, András - Anders, Alexandra - Faragó, Norbert) - Sebők, Katalin - Siklósi, Zsuzsanna - Tóth, Zsuzsanna (Eötvös Loránd University of Sciences, Institute of Archaeology)

**Abstract format:** Oral  
The Late Neolithic tell settlement at Polgár-Csőszhalom has since long commanded the attention of South-EastEuropean prehistorians. The enclosed tell and the single-layer settlement (67.5 ha), represented a special and a residential area. We examine the internal dynamics of interactions between houses, pits, wells and burials representing the different physical loci of human activities, as well as the spatial and functional associations of these loci and their social ranges.  
The large scale excavations realized between 1989-2005 brought to light large amount of archaeological finds. Ceramic, stone tools, animal bones and other finds represent different aspects of subsistence and social activities. In a diachronic tentative model we summarize the built structures and the find types associated with the community construction at Polgár-Csőszhalom together with the different patterns that could be reconstructed from their distribution and social background. The spatial distributions of different materials and their connections analyzed by Kernel density method, and the timescale modeled by aoristic approach. The multilevel interactions in the context of the human-thing entanglement played a prominent role in the connections of longer and shorter time frames.  
The reconstruction of the spatial module system of the complex settlement at Polgár-Csőszhalom would help to create a relative chronological framework for the site, and this can be used also as an extension for systematic absolute chronology.

**3** **DOMESTIC AND SYMBOLIC ACTIVITIES ON A TELL-LIKE SETTLEMENT AT ÖCSÖD-KOVÁSHALOM IN THE TISZA REGION**  
**Abstract author(s):** Füzesi, András - Raczy, Pál - Anders, Alexandra (Eötvös Loránd University)

**Abstract format:** Oral  
Lying in the boundary zone between the Tisza and Körös landscapes, the Öcsöd-Kováshalom site represents a remarkable spatial organization in the Late Neolithic settlement network of the Tisza region. A tell-like mound enclosed by seven smaller settlement clusters rose in the center of the settlement. The magnetometric prospection in 2018 demonstrated the presence of an enclosure of three concentric ditches. The archaeological investigation of the tell-like mound in the 1980s brought to light the remains of twelve timber-framed houses with bedding trenches from two occupation horizons.  
The excavated archaeological features clearly indicated an area divided into concentric activity zones. These zones outline the settings of the local interactions between quotidian and symbolic activity types and thus represent a site-specific intermeshed taskscape configuration. These patterns outline an essentially novel social, economic and ritual dynamism at the onset of the local Late Neolithic. During our investigation of the site, we were able to identify a series of symbolic activities linked to the spatial segments of various domestic activities at Öcsöd-Kováshalom that indicated special activity loci and activity trajectories that in a sense transcended the settings of quotidian activities.  
The special ritual paraphernalia, the burials and symbolic activities identified at Öcsöd, were mediums for expressing collective identity and integration, which they simultaneously also moulded at the turn of the sixth and fifth millennia BC, at the time of the emergence of the Tisza cultural system. The Öcsöd case studies on the special ceramic deposits and the burials reflect the colourful diversity of community actions and their complex patterns as well as the dynamics of their spatio-temporal changes.

**4** **FROM ROWS TO CIRCULAR ORDER. SETTLEMENTS IN THE LATE NEOLITHIC AND COPPER AGE EASTERN CARPATHIAN BASIN AND BEYOND**  
**Abstract author(s):** Rassmann, Knut (RGK - Romano-Germanic Commission DAI) - Terna, Stanislav (High Anthropological School” University) - Bánffy, Eszter (Romano-Germanic-Commission) - Raczy, Pal (Institute of Archaeological Sciences ELTE)

**Abstract format:** Oral  
The spread of Neolithic lifeways, including sedentary life from Southeast- to Central Europe was accompanied by an increasing diversity of the organisation of space, the structure of settlements, and also of house architecture. In the Alföld region, the dynamic of the differentiation became accelerated in the period of the transition from Late Neolithic to Copper Age (mid-5th millennium BC). It resulted in different regional traditions in settlement patterns and systems of networks. The long term process of the mosaic of this variety has to been seen in its interregional interconnectivity.  
Research projects in the last decades contributed a high amount of empirical data from excavations as from large scale prospections. The latter opened our perspective from small scale observations of house and house groups to the phenomena of the complete settlement and the settlement systems into the landscape. The presentation discusses the implications from this new research with the focus on tell sites and horizontal settlements; the contrary poles of the Vinča house rows (Zeilenstruktur) towards the development to a rather circular spatial order in the Cucuteni-Tripolye Culture.

**5** **HINTERLAND OF NEOLITHIC AND BRONZE AGE TELLS. REGIONAL-SCALE GIS MODELLING AND ANALYSIS OF POLGÁR ISLAND, NE HUNGARY**  
**Abstract author(s):** Mesterházy, Gábor (Castle Headquarters Integrated Regional Development Centre Ltd.)

**Abstract format:** Oral  
Many articles from the recent decades proves the focus of Hungarian archaeological research on tell and tell-like settlements. Near Polgár, Neolithic and Bronze Age sites were localized, excavated, studied and recently large-scale magnetometer surveys were also conducted to gain a better understanding about their structure and context. Although it can be stated that the role of these tells and tell-like settlements in the regional-scale settlement network is far less well defined. Therefore, this paper will focus on how these tells are embedded in the Neolithic and Bronze Age settlement network and what similarities and deviations can be observed between the two periods.  
The site database for this study is based on extended literature research, redating of older field survey artefacts. Furthermore, between 2012 and 2015 new systematic field survey were conducted on 20 km2 in order to locate periodical artefact distributions more precisely.  
The GIS modelling-based research will focus on the results of three methods to compare the Neolithic and Bronze Age settlement networks. Firstly, environmental reconstruction was carried out to enhance the resolution of the currently available vegetation models by defining a periodical “optimal” land cover. The multiscalar analysis of these datasets proved to be useful for characterizing the settlement’s environmental context. Secondly, to improve the incomplete archaeological site databases predictive modelling was applied and aimed to delineate a “primary habitation zone” for both periods. The environmental and social aspects of the modelling also highlighted minor differences between the studied periods. And thirdly, the theoretical reconstruction of former path and routes between settlements made it possible to analyse the characterization of least-cost path networks, like role of certain settlements in the network or frequency of certain routes.

**6** **BRONZE AGE MULTI-LAYERED SETTLEMENTS AND THEIR NETWORKS IN THE EASTERN CARPATHIAN BASIN. CASE STUDIES FROM WESTERN ROMANIA AND NORTH-EASTERN HUNGARY**  
**Abstract author(s):** Lie, Marian (Iasi Institute of Archaeology) - Gävan, Alexandra - Kienlin, Tobias (University Cologne) - Fischl, Klára (University Miskolc) - Zerl, Tanja - Röpke, Astrid (University Cologne)

**Abstract format:** Oral  
The Bronze Age multi-layered settlements in the Carpathian Basin have been to the fore of the archaeological research in the region starting from the second half of the 19th century. However, recent research carried out in various areas within the wider Carpathian Basin has dramatically changed our perception of these sites, revealing the existence of extensive outer settlements surrounding the mounds themselves. What these results suggest is that the Bronze Age tells were part of much more complex settlement systems than previously thought.  
This presentation will focus on recent fieldwork conducted in the Eastern Carpathian Basin, more specifically in Western Romania and North-Eastern Hungary, where numerous off-tell households have been identified in the immediate surrounding of several multi-layered sites through various non-invasive investigations (geophysical surveys, systematic fieldwalks, coring and aerial photography). The results of these investigations will be briefly presented and their effects on our current understanding of Bronze Age multi-layered sites will be discussed. The focus will be on one multi-layered settlement from Western Romania, the tell from Toboliu-Dâmbu Zăăcanului, and two multi-layered sites from North-Eastern Hungary, Emőd-Nagyhalom and Tibolddaróc-Bércút.  
All these multi-layered sites have similar material culture and have traditionally been ascribed to the Otomani-Füzesabony Cultural Complex. After a brief presentation of the newest results coming from these multi-layered settlements (including archaeobotanical and micromorphological investigations), a comparison will be made between the three sites. The main aspects under investiga-

tion will be similarities and differences in their settlement layout, the structure of their outer settlements and their relation to the mounds in functional and social terms. Matters related to site preservation issues will also be touched upon. Drawing on all these considerations, a discussion of internal trajectories within the two main regions under consideration will follow.

7 “DIVERSITY IN UNIFORMITY”. THE BRONZE AGE TELL SETTLEMENTS IN THE LOWER MUREȘ BASIN

**Abstract author(s):** Stavila, Andrei (West University of Timisoara) - Gogâltan, Florin (Institute of Archeology and Art History, Cluj Napoca; West University of Timișoara)

**Abstract format:** Oral

Having in mind the idea of “diversity in uniformity” of the Middle Bronze Age (MBA) habitation, in this paper we want to highlight the similarities, but especially the differences of what the tell settlements supposed in the Lower Mureș Basin. To do so we will refer mainly to: (1) the physical characteristics of the landscape speculated by each site; (2) the structures witch can be depicted for each site – either by magnetometry or by orthophotoplans; (3) the relationship between the archaeological sites and the main re-sources (distance to water, soils, minerals etc.) and (4) the relations between settlements.

To enhance the idea of diversity of the MBA habitation in the Lower Mureș Basin we will present, as a case study, a new tell settle-ment found at Alioș-Valea Alioșu (Timiș county). The site is known since 2008, but only through the materials collected during the field research and by the observation of the visible structures. The significant quantity of archaeological materials present on the surface of the site caught our attention, thus in order to depict the internal structure of the site a magnetometric survey was per-formed. Also the micro-landscape was highlighted through aerial photography and by the outputs of SfM processing algorithms. The non-invasive research revealed that the settlement corresponds to the habitation model found in the case of most archaeological sites of the MBA period.

8 JÁSZDÓZSA-KÁPOLNAHALOM — AN EMBLEMATIC SITE IN THE HUNGARIAN BRONZE AGE RESEARCH

**Abstract author(s):** Kulcsár, Gabriella (Institute of Archaeology, Research Centre for the Humanities) - Gulyás, András (Jász Múzeum) - Kiss, Viktória (Institute of Archaeology, Research Centre for the Humanities)

**Abstract format:** Oral

Jászdózsa-Kápolnahalom is an emblematic site of the Hungarian Bronze Age research. The site is located in the Northern Great Hungarian Plain. The remains of the Bronze Age settlement and the history of nearly half a thousand years (2000–1500 BCE) are preserved by a 540 cm of 16 layers/levels. The central tell site was surrounded by deep ditches and an open, ca. 40 hectares (500 × 800 meters) large Bronze Age settlement.

The main period of the excavations were conducted from 1966 to 1975, with the support of the Hungarian Academy of Sciences, in the framework of a tell program aimed at the research of the Neolithic and Bronze Age tell settlements. István Bóna and Ilona Stanczik and their colleagues here developed a new approach of the tell-excavation’s method. This methodology has remained de-cisive for decades in the research in Hungary, and to present days its elements are used in the research of the tell settlements.

In 2018-2019, we conducted a non-destructive survey of the site. In the course of this, the area of the tell and the medieval and ear-ly modern ruins of the church were surveyed by instrumental survey methods. In the second phase, complex non-destructive meth-ods were used to investigate the multi-age site around the site. This series of tests was supplemented with aerial photographs.

In our paper, the site is evaluated in a complex way from the point of view of archaeology and landscape history, looking at the land-scape and archaeological history of the period in the wider region.

9 KOSZIDER. RADIOCARBON DATING MULTI-STRATIFIED SITES AND THE LIFESPAN OF THE MOST EMBLEMATIC PHENOMENA OF THE MIDDLE BRONZE AGE CARPATHIAN BASIN

**Abstract author(s):** Nagy, Fanni (Damjanich János Museum, Szolnok) - Daróczy, Tibor (Aarhus University, Department of Archae-ology & Heritage Studies) - Csányi, Marietta - Tárnoki, Judit (Damjanich János Museum, Szolnok)

**Abstract format:** Oral

A wave swept through the Carpathian Basin, which fundamentally changed the face of societies, a horizon usually referred to as Koszider. Quite famous for its representative hoards and the fire destructions recorded in the last layers, usually interpreted as violent ends. The obvious question lingers in the shadows cast by the greatness of the finds: was this a generation-long event or a longer period?

In the heartland of this vivid Middle Bronze Age landscape, on either side of the Tisza river, two sites stand tall. Jászdózsa-Kápolna-halom is eminent by the innovative techniques and methodologies employed by the excavators in the ‘60s and ‘70s, while Túrkeve-Terehalom impresses by the sheer height and pristine archaeological contexts of structures and possible streets. Due to the skilled excavation and detailed documentation of finds, both present a unique opportunity. The former allowed for the radiocarbon sampling of bones from all levels, while the latter went a step further, by enabling sampling from the floors of all structures in all layers. In terms of relative chronology, both have their dawn in the latest phase of the Early Bronze Age and are inhabited well into the Middle Bronze Age. The lead-finds of their dusk are attributed to the above-mentioned horizon; hence, a synchronicity is stated and perpet-uated in the literature.

Through the employment of Bayesian-statistics, targeted and stratigraphically exhaustive sampling the precise habitation length of

each site is determined and the chronological correlation of layers from the two sites becomes possible. The obvious result of this comparative method of the two lifespans is, in fact, suggestive of the lifespan of the Koszider phenomena or, possibly, the lack of temporal consistency thereof.

a. THE LATE NEOLITHIC HOUSE BUILDING TECHNIQUES IN THE GREAT HUNGARIAN PLAIN (CARPATHIAN BASIN)

**Abstract author(s):** Bittner, Bettina (Castle Headquarters Integrated Regional Development Centre Ltd.)

**Abstract format:** Poster

For archaeologists, the daub as an artifact and a special source of information provides new data about the past communities. People constructed wattle-and-daub houses with wood frame in various forms also in the Neolithic in the Great Hungarian Plain. Burnt daub is a frequent archaeological find, we can find such fragments in pits or in ditches and at the former places of buildings. On the tell settlements there are very often in situ preserved burned houses, where is a possibility to study daub fragments in their original position.

My poster focuses on the daub fragments of the multi-storey building (House 11) from the Late Neolithic tell settlement of Pol-gár-Csőszhalom. One of my research aspects is the study of different imprints of daub surfaces. The preserved elements of the house construction have different characteristics, which makes it possible to fit the detected fragments to the original architectur-al components. So if we can classify the form and position of the imprints we can have an inference for certain parts of the original construction.

Based on the information of the „in situ” burned houses, we can identify the possible types of imprints and use these categories to analyze other daub assemblages. On this methodological ground there is a good starting point for the identification of daub fragments bearing imprints found in pits or ditches too. Another research aspect of the daub analysis has a connection with environ-mental archaeology. Sometimes on the surface of the daub fragments are preserved floral, seed and leaf imprints, and these provide information for the reconstruction of the paleo-environment.

282 PROTECTING CULTURAL HERITAGE IN FARMED AND FORESTED LANDSCAPES – MODELS OF ORGANISATION, SUPPORT, AND CASE STUDIES

**Theme:** 7. 25 years after: The changing world and EAA’s impact since the 1995 EAA Annual Meeting in Santiago

**Organisers:** Byrnes, Emmet (Department of Agriculture, Food and the Marine) - Holyoak, Vince (Historic England) - Cordemans, Karl (Flemish Land Agency)

**Format:** Regular session

The work of the EAA and EAC Working Group on farming, forestry and rural land management in recent years has focussed on the potential impacts of rural land-uses on the archaeological heritage, in particular intensive agriculture, restructuring of rural land holdings, and forestry expansion and management, and the capacity and limitations of the more widely established mechanisms for archaeological impact assessment, avoidance or mitigation, to address these concerns. Examinations have also been made, in the context of the European Union’s legal framework and financial support mechanisms for agriculture and forestry, most notably the Common Agricultural Policy (CAP) and the European Agricultural Fund for Rural Development (EAFRD), of policy prioritisation and formulation mechanisms at a European level to help mainstream heritage management considerations in these areas.

With reference to the second and fourth themes first discussed at the Conference held in Santiago de Compostela, Spain in 1995, namely Managing the archaeological heritage and Landscaping Archaeology, this year the Working Group wishes to convene a ses-sion to act as a forum for archaeologists working in the area at national, regional or local levels, to present short papers on the following themes:

- Models of organisation of and co-operation between heritage agencies and other public bodies for the protection of the cultural heritage in farmed and forested landscapes;
- The protection of cultural heritage in changing rural landscapes and in areas where there is significant ongoing rural land-use change; and
- Major restructuring programmes or projects within rural landscapes and the integration of cultural heritage considera-tions.

The latter theme is intended to attract presentations from archaeologists within public agencies or private companies working on major projects potentially impacting on the historic character of rural areas.

1 SUPPORTING THE CONSERVATION OF RURAL ARCHAEOLOGY AND HERITAGE IN ENGLAND AFTER THE UK EXITS THE EU

**Abstract author(s):** Holyoak, Vincent - Poppy, Sarah (HE - Historic England)

**Abstract format:** Oral

The UK has been one of the most enthusiastic adopters of agri-environment schemes under the Common Agricultural Policy’s Rural Development Regulation. In England, this has in turn led to over £300m being directly invested in the conservation and protection of rural heritage, including archaeology. Although the European Union does not have competency in, nor directly legislate for heritage, the CAP has enabled additional protection for England’s farmland archaeology through the regulatory measures which underpin the Single Payments Scheme (of farm supports). The UK’s exit from the European Union, and from the Common Agricultural Policy, therefore presents a challenge in terms of making sure that future mechanisms for agricultural support and the conservation of the wider environment mesh together to build upon, and hopefully enhance protection for archaeology and the wider historic landscape. This paper will outline the legislative measures that have been put in place with a view towards transitioning to a new Environmental Land Management Scheme which it is expected will launch in 2024. The scheme will replace direct agricultural supports with a system that instead rewards farmers for the provision of environmental and other public goods, including rural heritage.

2 A STABLE FUTURE FOR ARCHAEOLOGICAL MEASURES IN THE IRISH RDP

**Abstract author(s):** Carey, Hugh (National Monuments Service, Dept. of Culture, Heritage and the Gaeltacht)

**Abstract format:** Oral

For most of the time since the early 1990s, Irish agri-environment schemes have included some measures aimed at providing payment for the avoidance or upkeep of archaeological monuments on farmland. Although some good has come from this, the archaeological measures have always seemed slightly out of place and their position precarious, amongst the many natural heritage and farm management measures, forming the core of the schemes. The archaeological measures were amongst the first to go in 2009, as a result of economic recession, but are included in the current agri-environment scheme, albeit as relatively low-priority actions. Archaeological monuments were designated as Landscape Features in 2015 by the Department of Agriculture, Food and the Marine (DAFM). Archaeological information has been woven, by DAFM (in co-operation with the National Monuments Service), into Farm Advisors’ training events.

In the light of these positive developments, this paper will ask whether archaeology can be positioned in such a way as to make its position more secure in future schemes.

3 PROTECTING THE PAST, PLANNING FOR THE FUTURE: A CASE STUDY OF FOREST POLICY AND PRACTICE AND ARCHAEOLOGY IN IRELAND

**Abstract author(s):** Byrnes, Emmet (Forest Service Inspectorate)

**Abstract format:** Oral

Presently the role and contribution of agriculture and forestry in the European Union (EU) as a whole and within each of its Member States is being considered against a series of major global challenges and physical phenomena: climate change, the sustainable management of natural resources (water, soil, and air), and biodiversity loss; and international commitments given by the EU in respect of these, for example through the UNFCCC, the Convention on Biological Diversity, and the UN Sustainable Development Goals (SDGs). At the same time the European Commission has moved to modernise its main policy instrument for supporting agriculture, the Common Agricultural Policy (CAP), amongst other things with a view to ensuring the production of safe, high-quality, affordable, nutritious and diverse food for its 500 plus citizens and residents and a strong socio-economic fabric in rural areas, and which includes supporting emerging opportunities in the areas of trade, the bioeconomy, and renewable energy.

This paper will present a case study of the recent experience of Archaeological Unit in the Forest Service of Ministry of Agriculture in Ireland, in terms of the challenges and opportunities encountered and pursued in co-operation with the National Heritage Agency and other public bodies for integrating, maintaining, and enhancing measures for the protection of the archaeological sites and monuments and other elements of the cultural landscape in existing or planned forest areas. Specific points of detail highlighted will be a) national initiatives developed to respond to climate change, b) actions under the rules for the CAP for the period 2021-27, and c) competing societal, landowner, and industry demands and values around regulatory efficiency and the three pillars of the Aarhus Convention: access to information, public participation in environmental decision-making and access to justice in environmental matters.

AWARENESS-RAISING MEASURES IN THE CONTEXT OF SAFEGUARDING ARCHAEOLOGICAL HERITAGE IN AFFORESTATION PROJECTS

**Abstract author(s):** Bragança, Filipa - Bugalhão, Jacinta - Marques, João - Zambujo, Gertrudes - Lourenço, Sandra (DGPC) - Paiva, Belém (DRC Norte) - Moura, Helena (DRC Centro) - Melro, Samuel (DRC Alentejo) - Regala, Frederico (DRC Algarve) - Banha, Carlos (DRC Centro)

**Abstract format:** Oral

In the early nineties of the 20th century, essentially due to the devastating effects of intensive forestry in the Portuguese territory for pulp production, an archeological rescue program was held by the cultural heritage tutelage, financed by the paper production industry.

With the abandonment of this program in the late nineties and the appearance of contract archeology, work related to forestry became residual, resurfacing in 2014 with the participation of Directorate-General for Cultural Heritage (DGPC) and the Regional Culture Directorates in the revisions of the certification standards, such as FSC and PEFC.

With the increase of wildfires, of dramatic proportions in the years 2003 and 2017, and consequent reforestation actions marked by a high impact on the subsoil, greater control of these operations became urgent to guarantee the effective safeguarding of the archaeological heritage in forest areas.

In addition to the legal framework and inter-institutional relations that are established, the DGPC has been preparing some measures to raise awareness, not only for stakeholders related to local administration, with obligations in terms of territory management, but also for the public associated with forestry management that includes the owners, managers and forest investors.

This presentation therefore intends to show the initiatives that have been developed with the aim to introduce and to promote good practices related to the safeguarding of the archaeological heritage in forestry operations, seeking to foster a sustainable relationship between man and his territory, namely, with the Archaeological Heritage, a finite and non-renewable resource.

SUSTAINABLE DEVELOPMENT OF HISTORICAL LANDSCAPE IN FORESTED AREAS

**Abstract author(s):** Žaža, Petr - Mazáčková, Jana - Púčať, Andrej - Vaněčková, Daniela (Masaryk University)

**Abstract format:** Oral

Central Europe suffers lately from serious water deficits. Contemporary society is dealing with this problem in several ways. One of them is building water dams, especially in forested areas. These areas often contain medieval and early modern relics of defunct water dams, that could be reused for such purposes again by incorporating them in the new dams. Proper archaeological documentation and cooperation between archaeologists and landowners then results in virtual photogrammetric documentation. Thus, creating 3D resources available for future research, presentation, and education. Thanks to long-term research of the Rokštejn Castle and its economical hinterland (e.g. villages) these structures can not only be identified in the historical landscape, but can also be better protected against poor spatial planning, that often does not take historical landscape into account. One of the results of our ongoing project – Sustainable development of cultural landscape and protection of historic monuments in a forested environment – is a database of these anthropogenic relics for the members of the wider public, especially for land owners and construction companies.

NEW INSTRUMENTS FOR LANDSCAPE MANAGEMENT: THE BIOGOV TESTCASE OF THE GULP VALLEY

**Abstract author(s):** Cordemans, Karl (Flemish Land Agency)

**Abstract format:** Oral

In the framework of the Interreg Europe project BioGov (2018-2022) two new instruments for landscape management are tested in two case studies in Flanders. One of the case studies is the Gulp valley in Voeren, a Flemish enclave in Wallonia and bordered by the Netherlands and Germany. Part of the Gulp valley is a scheduled landscape. The pastoral and hilly landscape is highly appreciated by tourists. But the landscape is also under threat by intensive farming, causing erosion, flooding and deterioration of the natural and cultural heritage. Through participatory governance and in close cooperation with the Heritage Department and other departments of the Flemish government, a joint management vision was developed, integrating all sectoral views and maximising available budgets. New approaches for compensating farmers for ecosystem services delivered are being tested, with a special focus on result-based payment schemes. In the end, this will hopefully result in a more robust climate proof landscape where nature and cultural heritage conservation is realised in close cooperation with the local farmers.

SUSTAINABLE FARMING IN THE RATHCROGHAN ARCHAEOLOGICAL LANDSCAPE, CO. ROSCOMMON, IRELAND

**Abstract author(s):** Curley, Daniel (Rathcroghan Visitor Centre; Department of Archaeology, NUI, Galway)

**Abstract format:** Oral

The UNESCO World Heritage-nominated Rathcroghan Archaeological Landscape is regarded as the late prehistoric capital for the western province of Connacht. The archaeological remains indicate settlement activity from the early Neolithic Period (c. 5500 BCE) through to the later medieval period (1100-1600 CE). The core of the landscape is 6 sq km, located on an elevated plateau, and is comprised of 240 archaeological sites identified to date. These include prehistoric burial monuments, large scale linear embank-



ments, standing stones, roadways, medieval ringfort settlement sites, and medieval field boundaries. The focal point of this landscape is a large-scale multi-period earthen mound, deemed to have been a site of communal gatherings and ceremonies connected with prehistoric sacral kingship. The medieval Irish literary corpus highlights the importance of Rathcroghan into the historic period, and closely links it to the narrative of Ireland’s National Epic, the Táin Bó Cuailnge.

This part of mid-Roscommon is famous for its qualities as a pastoral farming landscape. However, the combination of modern agricultural practices and declining farm incomes has placed considerable stress on this well-preserved but vulnerable archaeological environment. Moreover, the legislative restrictions on agriculture and settlement in this sensitive area has led to depopulation and a resultant loss of services, meaning that Rathcroghan, which has been farmed for millennia, is becoming sterile.

As a result of these issues, the key stakeholders for Rathcroghan came together to attempt to turn this area into a greater resource for the entire community. In late 2018, the Rathcroghan Resource Community were successful in their application for a European Innovation Partnership, the first instance in Europe where such a project was applied to an archaeological landscape. This is a farmer-led approach to preserving and enhancing the archaeological resource, coupled with the trialling of innovative measures designed to improve the livelihoods of this farming community.

288 **ARCHAEOLOGISTS, SITES AND METHODOLOGIES: PROFESSIONAL AND PERSONAL NETWORKS IN MID 20TH-CENTURY EUROPE**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Mytum, Harold (University of Liverpool) - Gramsch, Alexander (Römisch-Germanische Kommission)

**Format:** Regular session

The decades either side of World War 2 saw considerable professional and academic exchange through collaborative excavations, conferences, and cross-border projects such as that researching the Roman Imperial frontier. Diffusionist models encouraged a European perspective, and scholars became exposed to different excavation techniques being employed across the continent. They also became increasingly aware of the socio-political implications of archaeological interpretations, and they became embroiled in or resisted the use of their archaeological results for political ends. This session explores the networks archaeologists constructed and maintained during the middle of the last century, sometimes across political and military conflicts. It confronts issues of nationalism, class and race that shaped these networks, and encouraged or hindered mutual understanding. Much of the data we still use today was created in these contexts; understanding the motivations, connections and methodologies of those involved is essential to appreciate the development of European archaeology. The session moves from individual biography through to institutional level networks, and from within particular countries to trans-continental connections.

**ABSTRACTS**

1 **GORDON CHILDE AND THE POPULAR FRONT: THE DILEMMAS AND COMPROMISES OF ANTI-FASCISM IN INTER-WAR EUROPEAN ARCHAEOLOGICAL NETWORKS**

**Abstract author(s):** Meheux, Kathryn (University College London)

**Abstract format:** Oral

Gordon Childe was one of the most famous archaeologists of 20th century, known for his Marxist approaches to archaeology. The interface between Childe’s archaeological thinking and political activism remains, however, largely unexplored. This presentation will focus on one of the most politically active periods of Childe’s life, the inter-war period, when Childe was involved with the European Popular Front Against Fascism. This anti-fascist activism fed into his archaeological writings and ultimately encouraged Childe to adopt orthodox Stalinist Marxism.

Childe’s archaeological writings, letters, archives, newspapers and other sources reveal the progression of his anti-Fascist activities and attitudes, grounded in his long-term friendships with progressive left-wing British intellectuals. Beginning with opposition to the Spanish Civil War (1936-39), Childe rapidly became a high profile and committed critic of fascist regimes and scientific racism in Europe. His activism included letters to the Press, lectures and writings; taking party in rallies; protesting about National Socialists participating in European archaeological meetings and providing support for refugees from Germany, notably Gerhard Bersu.

Childe’s activities brought him to the attention of the British Security Services (M15) and the British Union of Fascists and caused problems for him within conservative intellectual circles in Britain. But he also compromised, continuing to maintain links to some National Socialist colleagues, for example Bolko Von Richthofen, and worked with Fascist colleagues in Spain and Portugal. After the war, archaeologists in defeated Germany looked to him for help rebuilding and Childe, in spite of his growing advocacy of Soviet Russia and his previous anti-Fascism, provided it. Even for the most public and vociferous of anti-fascist critics, there were dilemmas and compromises made in name of archaeological co-operation between the wars.

2

**NO MAN IS AN ISLAND, EVEN WHEN INTERNED ON ONE: GERHARD BERSU’S WARTIME NETWORKS AND THE PRACTICE OF ARCHAEOLOGY**

**Abstract author(s):** Mytum, Harold (University of Liverpool)

**Abstract format:** Oral

Whilst interned on the Isle of Man for the duration of Word War 2, Gerhard Bersu managed to maintain significant networks through correspondence. He even gave an in absentia lecture to the Society of Antiquaries of London, delivered by Gordon Childe, which elicited further correspondence. Bersu also developed networks on the Isle of Man that enabled him to carry out extensive and long-term excavations beyond the confines of his camp. An investigation of the local and wider web of connections, revealed though letters preserved in archives, builds a picture of Bersu’s strategies to be archaeologically active despite his constraints of internment. Towards the end of the war, his concerns focus on his own future, but also that of archaeology in Germany and the fate of his colleagues there, both those who had embraced the Nazi regime and those who had not. Gerhard Bersu was also interned with his wife, Maria, for most of the war, and she also contributed to the network of communication and was clearly a key player in maintaining social and professional friendships through difficult times. Despite his apparent limited agency as an internee, it was Bersu’s use of his social capital articulated through networks that allowed him to achieve so much archaeologically when most of his contemporaries were engaged in wartime responsibilities.

3

**VISIGOTHIC AND CHRISTIAN HERITAGE IN SPAIN: PERSONAL AND POLITICAL NETWORKS AND THE FOUNDATION OF THE DAI-DEPARTMENT IN MADRID 1943-1953**

**Abstract author(s):** Sasse-Kunst, Barbara (Universität Freiburg)

**Abstract format:** Oral

The idea of a Gothic origin was always strong in Spanish history as was the Germanic origin for Germans. Before and during the fascist governments in Germany and Spain, archaeologists such as the German Hans Zeiss (1895-1944) and Spaniards educated in Germany such as Julio Martínez Santa-Olalla (1905-1972) intended to identify Visigothic cemeteries and settlement areas within Central Spain. This provided Spanish history with a better foundation for Castilian continuity and political centralism, with archaeology providing an ethnic interpretation. Shortly before the foundation of the Deutsches Archäologisches Institut (DAI) in Madrid, during a visit of Heinrich Himmler to Spain in October 1940, Martínez Santa-Olalla, Comisario General de Excavaciones since 1939, tried to involve the Ahnenerbe in his Visigothic investigations with a visit of the excavation of the important Visigothic cemetery of Castiltierra. Himmler didn’t come, nor later on in 1941 or 1942. In September 1941, a former student of Zeiss, Joachim Werner (1909-1994), was sent to Spain to initiate German cooperation in the excavation, now directed by Martínez Santa-Olalla, as a preparation for the Institut’s foundation on that theoretical base. In the end the Castiltierra project failed; Werner returned without success, and the DAI was founded in 1943 with a Christian archaeologist as his first director, Helmut Schlunk (1906-1982). After the troubles of World War II, the DAI was reinstalled in 1954 with the same director. This paper examines the personal and political networks in Germany and Spain which lay behind these developments. As a consequence, the study of Christian and Islamic architecture continues to dominate the Institute’s investigation of the medieval period.

4

**FROM GERMANY TO POLAND OR ALWAYS IN BETWEEN – SILESIAN ARCHAEOLOGY BEFORE/AFTER 1945. REPLACED NETWORKS, REVERSED ANTAGONISMS, PERSISTING DISCOURSES**

**Abstract author(s):** Reichenbach, Karin (University of Leipzig)

**Abstract format:** Oral

The peculiar situation of Silesia, as a former German-Prussian province turned into part of the revived Polish state after 1945 provides the setting of this paper. It will focus on the processes of political and administrative transformation affecting institutional structures, academic networks and research discourses of Prehistoric Archaeology.

While giving an overview of 20th century Silesian Archaeology from its early decades defined by professionalisation to the effects of post-war centralisation, the paper compares the framework for archaeological research before and after 1945. It will outline how the population exchange and the integration of the region into post-war Poland with its replacement and re-establishment of governance, networks and institutions lead to a fundamental change of the research infrastructures. It will further discuss the interrelation of this material dimension with the changing discourses of memory and identity politics conditioned by the border situation, the shift from German to Polish national affiliation as well as the reversion of the political system. Taking examples from archaeological discussions of the time the impact of the structural transition along with the respective national attitudes and discourse traditions will become obvious in the formulation of research aims and the interpretation models applied to material culture. More often than not did German and Polish scholars tend to claim the Silesian archeological heritage this way as “German(ic)” or resp. “Slavic/(proto-) Polish” and thus as their national belonging.

5 THE ELEPHANT IN THE ROOM. DENAZIFICATION AND ARCHAEOLOGICAL NETWORKING IN GERMANY AFTER 1945

**Abstract author(s):** Grunwald, Susanne (Independent researcher)

**Abstract format:** Oral

Based on my research on the reorganization of German Archaeology after World War II I want to talk about the Denazification of German archaeologists in three perspectives: First I describe denazification as a special topic of history of (German) archaeology and will sketch the development of talking and asking about it in German archaeological community. Secondly, I want to show differences of denazification in both parts of Germany and its effects on the scientific community. This will not only show differences between West and East but also between the western occupation zones and its effects on the development on regional networks. Finally, I want to ask about international networking with these German archaeologists after 1945 and will discuss the dictum of intellectual neutrality, postulated at the beginning of 1930s inside of the CISPP, under the conditions of post-war period and Cold War. A renewal of this dictum helped to ignore the “Elephant in the room” after 1945, but also to ignore responsibility of archaeologists as scientists in any era.

6 RACIAL SCIENCE AND MARRISM: CONTROVERSIAL IDEAS IN YUGOSLAVIAN ARCHAEOLOGY

**Abstract author(s):** Milosavljevic, Monika (University of Belgrade)

**Abstract format:** Oral

Yugoslavian archaeology is not separable as a distinctive term, rather as a network of scholars among national groupings of the former Yugoslavia. Matching the political circumstances in which it developed, it emerged in two stages: the first was between WWI and WWII (1918-1941), when the organization and interconnection among archaeologists across the first Yugoslavia was tenuous at best; the second occurred within Socialist Yugoslavia (1945-1991), where a number of institutions and scholars were involved in the modernization process of archaeology.

Immediately following World War II, in conjunction with other historical sciences, archaeology was understood to be an aid to the process of the emancipation of the Yugoslav peoples. At this time, the ideology of brotherhood and unity was crucial and sought legitimization through past narrativization. One of the important fields therein was early medieval archaeology in association with medieval history, which sought to portray Southern Slavic or Yugoslavians as a homogeneous group.

This homogenization was based on the theories of Nikolay Yakovlevich Marr, which were present in the former Yugoslavia. His theories supported the implicit racial science on the Dinaric race, discourse of which was widely popular prior to WWII and which archaeology came to incorporate into the narrativization of the past. The key role such theories played in the construction of Yugoslav ethnogenesis was based on the interpretation of material culture and archaeology.

The aim of this paper, therefore, is to discuss controversial concepts in Yugoslavian archaeology, based on knowledge transfers among scholars in European networks that lead to outdated ethnic theories to be applied in Yugoslavian archaeology.

7 THE IRON GATES RESCUE EXCAVATIONS PROJECT AND THE SHAPING OF ARCHAEOLOGY IN SOCIALIST YUGOSLAVIA

**Abstract author(s):** Jeremic, Gordana - Vitezovic, Selena (Institute of Archaeology Belgrade)

**Abstract format:** Oral

The construction of the water dam and hydro power plants in the 1960's – 1980's on the Danube in the Iron Gates region, which is at the same time the border between present-day Serbia and Romania (at the time, Socialist Federative Republic of Yugoslavia and Socialist Republic of Romania), was the reason for large scale rescue excavations projects, known as Iron Gates project I and II. These excavation projects were the largest rescue excavation projects ever carried out in the region and at the same time the most important event in the development of archaeology in socialist Yugoslavia.

The excavations included large number of already known important sites from the Roman and Medieval times, such as system of defensive forts from Traian Dacian wars, but also led to the discoveries of a series of very important prehistoric sites, including the discovery of the first traces of the Mesolithic in the region.

In this paper we will explore the course of these excavations and the consequences and impact they had on the archaeology in Yugoslavia. New discoveries changed then-current theoretical models and interpretations. Furthermore, the methodology of excavations changed considerably, in particular, these projects initiated the establishing the minimum requirements for documentation of excavations and the creation of standardised methodological practices. Also, they had considerable impact on development of institutions, in particular The Institute of Archaeology, as well as impact on personal carriers. Last but not least, foundations for regional and international cooperation were laid. Cooperation was established with archaeologists from western countries, in particular with experts in subdisciplines that were not practiced in Yugoslavia – anthropology, zooarchaeology, etc., but also with archaeologists in the region, including the collaboration with Romanian archaeologists that were excavating on the other Danube bank, which was particularly politically sensitive at the time.

8 INTERNATIONALISATION OF THE YUGOSLAV ARCHAEOLOGY AFTER THE SECOND WORLD WAR

**Abstract author(s):** Lorber, Crtomir - Novaković, Predrag (University of Ljubljana)

**Abstract format:** Oral

Archaeology in the countries which belonged to Yugoslavia (1918 – 1991) was mosaic of different traditions and developmental trajectories greatly affected by significant political changes in the SE Europe in the last 150 years; all of them required rather radical recontextualisation of archaeology and its practice. In this process, the re-vitalization of archaeology after the WW2, in the context of Socialist Yugoslavia, played fundamental role in building-up the actual national archaeological frameworks in all countries formed after the dissolution of Yugoslavia. Key role in this process was played by the Archaeological Society of Yugoslavia, established in 1951 as the principal coordinating scholarly organisation in the immediate post-war development of archaeology, conceptually and infrastructurally. While the society's principal task was creating conditions for strengthened and planned cooperation of archaeologists in the country (hardly the case in the preceding periods), other essential tasks also included the international promotion of the (new) Yugoslav archaeology. Indeed, in the time of the Kingdom of Yugoslavia (1918 – 1941) one could hardly speak of the ‘Yugoslav’ archaeology in the international arena. With the establishment of the archaeological society the situation quite radically changed in a very short period of time. Despite having less than 100 archaeologists in the 1950s, the society designed very ambitious development plans, which also included the ‘internationalisation’ of the Yugoslav archaeology (exchange of publications, participation at the international conferences, grants, inviting foreign scholars, special publications published exclusively in foreign languages etc.). The peak of these early endeavours was reached by participation at the 1st International Congress of Slavic Archaeology in Warsaw (1965) and organisation of the 8th Congress of the UISPP in Belgrade (1971), the event which could not be organised without intensive promotion and networking of the Yugoslav archaeologists in the international academic arena in the 1950s and 1960s.

291 EUROPEAN RESEARCH COUNCIL (ERC) GRANTS: WHAT ARE THEY, HOW TO APPLY?

**Theme:** 7. 25 years after: The changing world and EAA's impact since the 1995 EAA Annual Meeting in Santiago

**Organisers:** Grassi, Silvia (European Research Council) - Baleriaux, Julie (European Research Council)

**Format:** Workshop

The European Research Council, set up in 2007, is the first pan-European funding body that supports investigator-driven frontier research across all fields on the sole basis of scientific excellence.

The ERC funding schemes are open to ambitious researchers of any nationality or age who wish to carry out their research in a public or private research organisation located in one of the EU Member States or in associated countries.

There are four core funding schemes:

- Starting Grants: for researchers with 2-7 years of experience since completion of PhD, with a scientific track record showing great promise (grants up to €1,5 million for 5 years);
- Consolidator Grants: for researchers with over 7 and up to 12 years of experience since completion of PhD, with an excellent mid-career scientific track record (grants up to €2 million for 5 years);
- Advanced Grants: for established and scientifically independent researchers who are leaders in their field of research (grants up to €2.5 million for 5 years);
- Synergy Grants: for a group of 2 to 4 researchers working together and bringing different skills and resources to tackle ambitious research problems. There is no specific eligibility criteria regarding academic career level for ERC Synergy Grants. One researcher per group can be hosted by an institution outside of the EU or Associated Countries (grants up to €10 million for 6 years).

This workshop will explain the application and selection process of ERC grants, with a focus on archaeological projects. Speakers will include current and former ERC grantees, who will share their experience and “tips” on how to make a convincing application. Presentations will be followed by a Q&A.

Whether you are thinking of applying or just curious, this workshop might be a game-changer for your career.

293 ROUND AROUND THE CIRCLE – CIRCULAR PHENOMENA AND THEIR MEANINGS IN EUROPEAN PREHISTORY

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** P. Barna, Judit (Magyar Nemzeti Múzeum Régészeti Örökségvédelmi Igazgatóság) - Pásztor, Emília (Türr István Múzeum, Baja) - Pusztainé Fischl, Klára (Miskolci Egyetem BTK, Történettudományi Intézet, Őstörténeti és Régészeti Tanszék) - Pusztai, Tamás (Magyar Nemzeti Múzeum Régészeti Örökségvédelmi Igazgatóság) - Kovárník, Jaromír (Univerzita Hradec Králové, Filozofická fakulta, Katedra archeologie)

**Format:** Regular session

Circular building elements in space separate places from others. Encircling a place, breaking it from its surroundings is a specific act of the communities, which has both practical and symbolic meaning. If the circular arrangement of space was also expressed in other media, we could assume that this repetitive form had added connotation, a symbolic significance. In cases where a clear pattern

in using angular (rectangular, cross-shaped) and/or circular forms in everyday ancient life can be determined, archaeologists could rightly ask what the difference in the meaning of these two archetypes was (e.g. The distinction between the dead and living, the sacred and profane or celestial and earthly worlds).

Did the circular arrangement of space indicate networking between communities (e.g. Like the shared “Rondel idea” for the different territorial groups of the Middle European Late Neolithic cultures such as the Lengyel culture etc.)?

We invite papers for this session from all periods of Prehistory starting from the Palaeolithic to the end of the Iron Age, where the circle and its repetition is a common element in the conception of space: earthworks, circular ditch systems, burial grounds (mounds, barrows), settlements, houses, and supporting materials carrying this motif – ceramics, metals etc.). We aim to gather papers showcasing archaeological remains that offer the possibility to decode the choice of circular arrangement separately from or simultaneously with the angular arrangement of space. The recognition, emphasis and understanding of the use of these two distinct forms in the arrangement of space would be the focus of our discussion.

ABSTRACTS

1 THE IDEA OF ORDER – CIRCULAR ARCHETYPES IN THE CARPATHIAN BASIN

**Abstract author(s):** Pusztaine Fischl, Klara (University Miskolc) - Larsson, Nicklas (Hungarian National Museum)

**Abstract format:** Oral

In his book on circular archetype in Prehistoric Europe Richard Bradley focussed mostly on the West European aspects of prehistoric circular phenomenon. However, circular spatial constructions were often applied also in Eastern Europe to create places. This presentation focuses on such sites found from distinct periods in the Carpathian Basin, with circular forms as main features of shaping the place. Walls, ditches, palisades, decorations on ceramics or metals in this form have a lot of interpretations. The most known examples are the so-called rondels from the end of the Neolithic Period. Their connections to the sky and sacrificed actions are well known. Circular structures around or inside settlements can have more varying narratives, from defensive roles through arranging the daily life in distinct areas or spheres up to chronologically separating the sites. The repetitive occurrence of the circular forms in distinct materials might have symbolic significance and can be used as identity markers of certain periods.

The archetype thus can help identifying the chronological order of a site. In the second half of the presentation we would like to show an example from Méra, where recent large-scale excavations, geophysical surveys and field-walking have revealed a Bronze Age settlement inhabited for the most part of the second millennium BC, ending in the beginning of the first millennium BC. Situated at a geographically important and distinct location the inhabitants used the circular forms for ordering the space in varying ways through consecutive generations. The site offers a unique opportunity to explore the changes through time, with which a population embraces and embodying the concept of circularity.

2 CIRCULAR SPACE SEPARATION AND THE MEANING. PREHISTORIC CASE STUDY

**Abstract author(s):** Pasztor, Emilia (Türr István Museum, Baja)

**Abstract format:** Oral

Circular spaces and structures are found in all cultures, regardless of time and geographical location.

The most well-known monuments from prehistory in Europe are the megalithic stone circles and the circular earthworks.

Circular settlement systems, structures and sacral buildings were shaped by several factors: safety, community demand, worship, expression of emotions and experience of decision makers and builders (Bardzinska-Bonenberg 2016).

After a brief historical overview, the author presents several ethnographic examples of traditional communities. They testify such material traces of circular spatial separation, that can be visible even for a long time.

These examples can serve as analogies for the interpretation of circular archaeological monuments in Europe.

As a prehistoric case study, the author investigates the circular earthworks of late Neolithic Lengyel culture, the rondels and through comparative methods she attempts to interpret the layout, the concentric ditch system, “the gates” – the interruptions of the circular shape, and to explore symbolic meaning, their relationship with their terrestrial and celestial environment.

3 ROUND AND ROUND. THE ORGANIZATION OF SPACE AT EARLY NEOLITHIC GÖBEKLI TEPE FROM THE POINT OF VIEW OF FOOD PRODUCTION

**Abstract author(s):** Dietrich, Laura - Dietrich, Oliver (Orient Department of the German Archaeological Institute)

**Abstract format:** Oral

Göbekli Tepe in southeastern Turkey has produced the earliest so far known monumental architecture, dating to the 10th and 9th millennium BC. The site consists of monumental round to oval buildings, erected in an earlier phase, and smaller rectangular buildings, built around them in a partially contemporaneous and later phase. The monumental buildings are around 20 m in diameter and have stone pillars that are up to 5.5 m high and often richly decorated, mostly with animal reliefs. The buildings have been interpreted as spaces for ritual activities. The rectangular buildings are smaller and—in some cases—have up to 2 m high, mostly undecorated, pillars. Especially striking is the number of tools related to food processing found at the site, including grinding slabs/bowls, hand-

stones, pestles, and mortars, which have not been studied before. We analyzed more than 7000 artifacts so far. The high frequency of artifacts is unusual for contemporary sites in the region. Contextual analyses of the distribution of the elements of the grinding kit on site highlight a clear link between plant food preparation and the rectangular buildings and indicate clear delimitations of working areas for food production on the terraces the structures lie on, surrounding the circular buildings roughly in a semi-circle. There is evidence for extensive plant food processing and as no large storage facilities have been identified, we argue for a production of food for immediate use and interpret these seasonal peaks in activity at the site as evidence for the organization of large work and ritual feasts. The organization of space with the working areas surrounding the circular monumental buildings may have been a deliberate choice to emphasize the importance of these buildings.

4 CLAIMING SPACE: NEOLITHIC ENCLOSURES IN THRACE

**Abstract author(s):** Nikolova, Nikolina - Bacvarov, Krum (National Institute of Archaeology & Museum, Bulgarian Academy of Sciences)

**Abstract format:** Oral

Enclosures are a widespread feature in European prehistory that first appeared in the Balkans at the beginning of the neolithization. In Thrace, it seems that most Early Neolithic settlements were enclosed even though the evidence is limited as very small areas of the sites have usually been excavated.

This presentation will focus on the concentric circular pattern of ditch construction that was revealed at several sixth-millennium BC sites in Bulgarian Thrace, and will argue that the episodes of ditch digging, re-filling, re-cutting, and digging new, larger – but never intersecting the older, by-then already filled-in ones – ditches, were an intentional and well organized communal effort to create and maintain social identity over a long period of time. The ditches were planned as an integral part of the settlement; they were the scene of systematic (ritual?) deposition of architectural remains and various objects, and were used as burial space. The cycles of repeated re-cutting and re-filling of ditches followed by new ditch digging also served as a mechanism of control over the landscape.

5 LIKE MUSHROOMS AFTER THE RAIN: NEOLITHIC CIRCLES IN THE SOUTHERN CARPATHIAN BASIN

**Abstract author(s):** Kalafatic, Hrvoje - Šiljeg, Bartul (Institute of Archaeology Zagreb) - Šošić Klindžić, Rajna (Faculty of Humanities and Social Sciences)

**Abstract format:** Oral

Southern Carpathian Basin is a region situated between three mayor central European rivers: Dunav, Drava and Sava. These rivers together with their tributaries Vuka, Karašica and Bosut define region optimal for archaeological landscape research with remote sensing techniques due to its characteristics as it is a lowland area with fertile land divided on large agricultural plots which provide better visibility of archaeological remains.

During middle Neolithic we can trace enclosures of Starčevo culture in rectangular or free raster. From the Late Neolithic in the 6th millennium BC in Carpathian Basin developed circular fortified settlements, some of which in long term eventually grow into settlement mounds, tells. Our modern perception, which is developed from some of extraordinary examples of settlement mounds dominating the landscape, is only partly accurate as they are usually part of the much larger complex settlement structures. Remote sensing showed that much more stays hidden in landscape and this presentation aims to investigate changing perceptions on Neolithic landscapes in eastern Croatia and to reconsider the dynamics of human-environment interactions. Detailed analysis of all available old and modern maps, satellite and aerial photography together with field survey results provide data for analysis of landscape usage during Neolithic in the lowlands of southern Carpathian Basin.

High density of such circular enclosures in Southern Carpathian Basin make this region as key area for understanding of this phenomena.

6 FINDS OF RONDELS ON THE RIGHT TERRACE OF THE ELBE RIVER NEAR HRADEC KRÁLOVÉ (EASTERN BOHEMIA)

**Abstract author(s):** Kovárník, Jaromír (University of Hradec Králové) - Tirpák, Ján (Constantine the Philosopher in Nitra)

**Abstract format:** Oral

Thanks to the application of aerial archaeology, rondels of the Stroked Pottery culture (SBK), subphase IVa, were discovered on the right terrace of the Elbe River between the towns of Jaroměř and Hradec Králové in eastern Bohemia. There were at least eight rondels were in a length of 15.5 km from the north-northeast to the south-southwest. Of course, all these rondels were not contemporary, but only some of them. Geophysical measurements have been gradually applied to the findings of these circular earthworks. The results of the cesium magnetometer measurements made important data more precise. Double rondels have joined ditches at entrances. For example the triple rondel Semonice had differences in the shape of the entrances (simple shapes of entrances at the inner ditch and at the southern entrance, or connected ditches at the place of the eastern, northern and western entrance). The ends of the ditches at the northwest entrance to the triple rondel near Plotišť n / L indicated their connection. However, archaeological research has shown the existence of wing-like elongated ends (the so-called corridors) inwards at the middle ditch. Simple or multiple rondels were probably multifunctional monumental gathering areas of circular shape with a system of ditches, banks and internal or external palisades that were interrupted by entrances.



The entrances were often astronomically oriented. At Hradec Králové it is one of the largest concentrations of rondels. A large number of rondels show that there was a very dense settlement system along the Elbe River and along its tributaries up to the sources of these streams during the younger stage of the SBK. Rondels on the very important right terrace of the Elbe River were placed near confluences, which were also crossed by Neolithic trackways. The round shape of the rondels could reflect the cyclicity of time.

7 **3 PALISADES, 2 DITCHES 1 RECUT = 3 SUCCEEDING REPLICATED PHASES? A PROPOSED CONSTRUCTION-SEQUENCE OF THE BODZÓW RONDEL**

**Abstract author(s):** Nebelsick, Louis D. (Unwersytet Kardynała Stefana Wyszyńskiego w Warszawie)

**Abstract format:** Oral

Based on the results of the excavations at the rondel in Bodzów in Southwest-Poland, I propose that multi-palisaded and ditched middle Neolithic rondels are in fact multiphase outwardly expanding enclosures. Each of these phases was made up of a single post-built circle accompanied by a ditch. In Bodzów, three closely spaced palisade trenches were accompanied by a broad, drastically re-cut inner ditch and a thinner one phase outer circuit. This strongly suggests that the monument had been replicated three times with each succeeding palisade/ditch circle enclosing the space defined by its predecessor. A review of carefully excavated and surveyed rondel sites suggests that this is, in fact, a standardized sequence leading to what appear to be multi-ringed rondel enclosures. Single to three-phase rondels are common. In rare cases, particularly among the southern rondels, there is evidence for five or more renewals. These observations are augmented by the results from field trials of free-standing fences and palisades which show that such structures decay quickly and have surprisingly short lifespans. They suggest that far from being long term monuments whose life span archaeologists imagine spanning anything from 50 to 200 years, ditched and palisaded rondels were ephemeral structures enclosing circular sacred space whose use-life will not have exceeded 5 to 10 years and were, if the community found this necessary, replaced by larger single ditch and palisaded circle after being abandoned and/or razed.

8 **NEOLITHIC CIRCLES. A MONUMENTAL PHENOMENON IN SOUTHERN SWEDEN**

**Abstract author(s):** De Lorenzi Turner, David (Stockholm University)

**Abstract format:** Oral

When studying monument construction in the Neolithic period, there is an tendency to study monuments in stone and earth, while monuments in wood are not considered. Post-circles are a type of Neolithic monument consisting of individual upright timbers which have been constructed to form a circle. At times these circles can be concentric, creating rings of timbers of differing sizes which nest inside each other. However, the form and size of them differs greatly; sometimes they combine wood and stone in the architecture; some have open avenues, whereas others do not. Post-circles often form part of wider monumental architecture and Post-circles are often located within other types of monument. Post-Circles occur in northern Germany and the Netherlands, they have mainly been noted in the British Isles . However recent years excavation has shown post-circles in Southern Sweden , and on Bornholm. The monuments of the British Isles are generally considered to represent a uniquely British phenomenon, unrelated to Continental Europe; Spatzer and Bertemes demonstrate that this position should be reconsidered (2018). Their study illustrates aspects of society, beliefs, ritual practice and organization of landscapes during the transition from late Neolithic to early bronze age. To develop this idea further there is a need to include the recently discovered circular monuments in Scandinavia. I intend to introduce this material and present the idea for discussion that there can be a network of monument building.

9 **ROUND? CIRCULAR? OR? PATTERNS OF NEOLITHIC AND CHALCOLITHIC SETTLEMENT LAYOUTS IN THE SOUTHEASTERN AND EASTERN EUROPE**

**Abstract author(s):** Hofmann, Robert - Shatilo, Liudmyla (Kiel University, Institute for Prehistoric and Protohistoric Archaeology, Germany) - Rassmann, Knut (German Archaeological Institute, Romano-Germanic Commission - RGK, Frankfurt a.M., Germany) - Müller, Johannes (Kiel University, Institute for Prehistoric and Protohistoric Archaeology, Germany)

**Abstract format:** Oral

Large-scaled high-resolution archaeo-magnetic surveys, carried out during the last decade by different research groups, provide completely new possibilities to understand Neolithic and Chalcolithic settlement layouts on local levels. Also at geographical meso and macro scales, the investigations contribute significantly to the deeper understanding of the dynamics of historical processes. In our paper we would like to compare the spatial organization of circular settlements related to societies in the Lower Tisza region, on the one hand, and human societies with the label Tripolye, in the forest-steppe zone east of the Carpathians, on the other hand. Settlement layouts are contextualised, their components analysed and discussed with regard to their possible interlinkage. Although settlement plans of the two regions may at first glance show formal similarities, closer analysed, they reveal very different principles of spatial organisation. In both cases the settlement plans seem to reflect alternative, democratic forms of communal social organisation and decision-making.

10 **CIRCULAR ARRANGEMENT OF SPACE AT THE ENEOLITHIC SETTLEMENT OF LASINJA CULTURE AT ZGORNJE RADVANJE (NE SLOVENIA)**

**Abstract author(s):** Kramberger, Bine (Institute for the Protection of Cultural Heritage of Slovenia)

**Abstract format:** Oral

Excavations (conducted by the Institute for the Protection of the Cultural Heritage of Slovenia) between 2007 and 2008 at Zgornje Radvanje, the southernmost part of Maribor in Northeast Slovenia, yielded traces of a so far unique settlement of the Lasinja culture, dating to second half of the 5th millennium BC. The particularity of this settlement is its circular layout, which is visible from the arrangement of different pits and the remains of rectangular houses in three (or perhaps four) circles around an empty space in the centre. Some of the houses had sunken floors, thus they can be interpreted as pit houses, while others are post in ground constructions. In this paper, a possible background of the circular arrangement of space is discussed by looking at the different types of settlement features (e.g. houses with and without sunken floors), their distribution within the settlement, distribution of pottery finds and finally on the results of 14C AMS dating. Astonishingly, it can be recognized that the architecture of the houses varies within the different circles of the settlement: with one exception, only post in ground constructions appear in the most inner circle of the settlement, while in the second and the third circle pit houses and smaller associated pits prevail. Yet, the new set of 14C AMS dates indicate that the pit houses and the post in ground constructions existed at the same time span thus may represent buildings of different functions. Of special interest and importance is also the aforementioned single pit house within the inner circle of the settlement. Some exceptional finds were uncovered in this building and they may indicate a special role of the building or of their inhabitants.

11 **SYMBOLISM OF CIRCULAR SANCTUARIES AROUND 2000 BC – A CASE STUDY FROM CENTRAL GERMANY**

**Abstract author(s):** Spatzier, Andre (Landesamt für Denkmalpflege Baden-Württemberg)

**Abstract format:** Oral

The rondels of Pömmelte and Schönebeck, dating to the late 3rd and early 2nd millennia BC and located within sight to each other in today Central Germany, decisively contribute to our understanding of prehistoric circular enclosures. The evidence discovered since 2005 suggest that, although construction dates differ, they coexisted and that each monument had individual meaning.

Symbolism is reflected on several levels: On the site level the findings indicate a multi-faceted symbolism of the individual monuments. On the microregional level there may have been a complementary symbolism of both rondels. It can be suggested that Pömmelte and Schönebeck represented a dialectic dualism, both having served specific, perhaps mutually exclusive purposes. They probably were antithetic ‘non-mundane’ focal points with a sacral landscape.

Furthermore, there is evidence for a symbolism in the acts of building and abandoning circular sanctuaries as complex social processes. While at Schönebeck the evidence indicates a multi-stage construction, at Pömmelte building possibly reached a final stage, which may have been one reason to dismantle this enclosure ritually. Particularly this aspect – the “get-together” during construction and de-construction of highly metaphorical communal buildings – is an example of past social networking in action, in a certain sense more tangible than – and perhaps a glimpse into the mechanisms of – networking between communities expressed in a shared “Rondel idea”.

12 **THE CIRCULAR SETTLEMENT PATTERN IN THE EARLY BRONZE AGE OF THE CARPATHIAN BASIN. THE BORBAS PROJECT**

**Abstract author(s):** Pusztai, Tamas (Hungarian National Museum) - Pusztainé Fischl, KLára (University of Miskolc) - Kienlin, Tobias (University Cologne) - Kertész, Gabriella (Herman Ottó Múzeum)

**Abstract format:** Oral

Encircling a place or a settlement is a common phenomenon from the beginning of human history. However, there are times, when the circle becomes the most important organizing principle of domestic life. Such a period is the Early Bronze Age of the Carpathian Basin. Our presentation shows the results of a research project entitled “Borsod Region Bronze Age Settlement”(BORBAS) going on in the north-eastern part of the Carpathian basin which started in 2012. The settlements in the investigated micro-region have a circular layout organized by shared rules between the end of the third Millenium BC and the first half of the second millenium BC. The main elements of the settlement structure are a core constituted by a tell, a ditch, a dwelling area and a pit zone, all in a concentric ordering around each other. In many cases, this structure was repeated by artefacts decorated in different ceramic styles. Based on the presence of the ditches, these settlements were often interpreted as defensive establishments. In our paper, we argue that this circular pattern has not a merely defensive role but played a crucial role also in the identity of the inhabitants. We can find the same pattern also on the ceramic and bronze artefacts from the investigated period. Exactly that is why we think that this “pattern” in the ordering of space on the one hand and as a stylistic element decorating artefacts, on the other hand, have a meaning which affects as a sign for the communities involved.

We would like to support this interpretation by several examples from the results of our research project.

NEW LOOK AT EARLY IRON AGE FORTIFIED SETTLEMENTS AT THE BORDERLAND OF POMERANIAN AND WEST BALTIC BARROW CULTURES (NORTH POLAND)

**Abstract author(s):** Solecki, Rafal (Cardinal Stefan Wyszynski University in Warsaw)

**Abstract format:** Oral

The borderland of Early Iron Age Pomeranian and West Baltic Barrow cultures (North Poland) is interesting, especially when it comes to the issue of fortified settlements that are known from this area. They originality results from the characteristic topographical relief, where the central enclosure is surrounded with at least two lines of circular ramparts and dry moats. A number of such sites were described in the late XIX and early XX century by German and after II World War by Polish archaeologists. Unfortunately, most of these sites was partially destroyed or disturbed by younger habitation of mediaeval or post mediaeval period.

During past decade over a dozen of new sites of that type were discovered. We owe it to the use of ALS technology in the forested and hard to reach areas. Moreover, most of these new settlements were preserved in relatively good condition. It let the archaeologists to acquire new data to set the chronology of these sites and describe the material culture of people who lived there. These new studies has not changed completely previously stated hypotheses. Rather it helped to close the chronological frame more precisely and gain information about the cultural influences that can be noticed in material culture.

a. VENUS FIGURINES AND CIRCULAR NATURE OF LIFE

**Abstract author(s):** Talbot, Amy (University of Bradford)

**Abstract format:** Poster

Based on research from Lioudmila Iakovleva (2015), this poster wishes to suggest that the temporary circular mammoth bone “Yaranga” or “tipi” structures as found across Central Europe and the Russian Plain in the Upper Palaeolithic may in fact be centres for childbirth.

Iakovleva (2015) discusses the use of feminine imagery within certain mammoth bone structures, and associated the mammoth with female existence, while the temporary nature of some of the structures as discussed by Soffer (1985), Pidoplichko et al (1998) and Svoboda (2003) has based discussion around easy to build structures that are raised around the larger mammoth bone structures. Upon separate research (Talbot 2019) regarding the Central European Venus figurines, a correlation was observed where the figurines where often found in areas where the tipi or Yaranga structures had been excavated, potentially moving the concept of “Mother Goddess” into a Central European Shamanistic totem for prosperity in childbirth. This correlation with the 2015 research into the femininity of the mammoth bone structures could potentially bring new narratives and dialogue into discussions around motherhood and childbirth in the Upper Palaeolithic.

While the structures and the Venus figurines on their own have been examined across countless reports and specialist workings, there has been very little research that places the Venus figurines back into their original context from which they where excavated. Using a New Materialism methodology of interpreting the sites holistically alongside an Archaeology of Emotion the poster hopes to enable new discourse around motherhood, spirituality and childbirth in the Upper Palaeolithic.

b. NEW DISCOVERIES OF CIRCULAR DITCHES: ANCIENT MONUMENTS IN THE NORTH-EAST BOHEMIA

**Abstract author(s):** Kucharik, Milan - Blažková, Tereza (Labrys o.p.s.)

**Abstract format:** Poster

The poster presents newly discoverd praehistorical sites in North-East Bohemia, Czech Republic. Dry wheather of last few years has revealed previously unkown praehistorical sites with circular ditches. We have discovered Late Neolithc circular ditch enclosure (rondel) in Hradec Kralové - Kukleny during the aerial prospection in 2010. The rondel has two ditches and at least two entrances on the northern and western side. The inner ditch is about 3 m wide and outer ditch is about 1,5 m wide. The outer ditch is not continuous. During last two years we have also found three new sites on orthophotomaps. Newly found ground circular feature in Vestec near Jaroměř (Náchod district) is most probably another Neolithic rondel. This rondel has probably four ditches. Another two circular monuments with simple ditch were discovered in Dohaličky and Mžany (Hradec Králové district). These are probably ditches surrounding the foot of the burial mounds of the Bronze Age origin.

c. A CIRCULAR PIT ALIGNMENT AT AN EARLY BRONZE AGE SETTLEMENT NEAR TO SZEGED (HU)

**Abstract author(s):** Szalontai, Csaba (Hungarian National Museum / Magyar Nemzeti Múzeum)

**Abstract format:** Poster

We discovered traces of a village with a loose structure dated to the Early Bronze Age Makó-Kosihy-Čaka culture at Kiskundorozsma-Subasa, Vágóhíd site.

An area constituted by pits arranged in a circular form was separated at one part of the settlement. These pits set out an almost regular circular area with a 17.5-meter diameter, in the middle of which we excavated two small post holes. An imaginary axis connecting the two post holes points almost exactly toward an east-west direction. Mostly middle-sized pits with roundish openings indicated the arc of the circle. There were seventeen pits in total. We discovered pits of size and structure like the previous pits also inside the circular pit alignment.

If one drew an imaginary axis through the pit alignment in a north-south direction it divides it into two parts: an eastern and a western half. Solely one piece of sherds was discovered from one of the pits lying on the eastern arc of the circle, the rest of them were empty. None of the pits westward from the axis lacked finds. Most of them contained more than 10 sherds.

Based on the size, the structure and the finds excavated from the pits the circular pit alignment can probably be interpreted as an area used for some ritual purposes.

TINY TALKS ON TINY THINGS: NETWORKS ENCAPSULATED IN MINUTE OBJECTS

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Miller Bonney, Emily (California State University Fullerton) - Adams, Sophia (SUERC, University of Glasgow) - Lucíañez Triviño, Miriam (University of the Basque Country, UPV / EHU)

**Format:** Session with presentation of 6 slides in 6 minutes

This session explores networks encapsulated in tiny objects and tiny objects within networks. We invite participants in the session proposed here to reflect on the issues surrounding the crafting of prehistoric tiny objects by focusing on particular examples. Susan Stewart’s On Longing looks at the miniature (she uses dollhouse furnishings and tiny books for examples) as powerful embodiments of all the characteristics of the object represented because of, rather than in spite of, their diminutive scale. We suggest that this line of thought can be applied as well to tiny objects from the archaeological record both in and of themselves and as participants in other networks. Little objects may be viewed as microcosms of networks. A single item, by the material from which it is made, the skill required to produce it and the context in which it was found. can give us a route into understanding the world in which it was produced, used and deposited. Following Stewart’s lead, we ask how that network of relationships is embodied in the object. Tiny objects also can provide evidence of otherwise unseen networks, surprising the excavator by the context in which the item appears. How did this particular item, or the artisan who made, it end up here? What networks of trade, political relationships, and behavior brought it to its final resting place or led to its creation? In the format chosen for this session – six minute long papers with a maximum of six slides - participants are invited to reflect on how tiny objects - from miniature bronze axes to bone pins to ceramic thumb pots - may be enmeshed in and help create a variety of networks.

ABSTRACTS

1

SEALING A NETWORK

**Abstract author(s):** Miller Bonney, Emily (California State University Fullerton)

**Abstract format:** Oral

A tiny serpentine conoid seal from Tomb IIA at the Bronze Age Cretan site of Lebena Yerokambos reveals networks of craftspeople, social interaction and artistic forms. Serpentine is popular throughout the Bronze Age in the manufacture of bowls, figurines, seals and beads so the seal is linked in a material network both physical and chronological. The decoration appears to be identical to that on seals from at least two other sites, one about 12 miles to the northeast and the other about 18 miles to the northwest suggesting a network of seal crafters. Some scholars have suggested all were made by one individual. But those same motifs appear on the incised decoration on fine grey ware pyxides from the same tomb, perhaps another kind of crafting network including a network of cross-crafting. All these characteristics suggest that even a seemingly unprepossessing object can disclose relationships across time, space and crafters.

2

A WELL-TRAVELLED CHARIOT: IDENTICAL SEAL IMPRESSIONS AND THEIR PLACE IN NETWORKS OF COMMUNICATION IN THE BRONZE AGE AEGEAN

**Abstract author(s):** Finlayson, Sarah (Universität Heidelberg)

**Abstract format:** Oral

Sometime around Late Minoan IB (roughly 1500-1450 BCE) on Crete, a gold ring, with a sealing face of approximately 3x2cm and depicting a chariot and its charioteer, was used to seal the clay securing six small parchment documents, carefully folded and tied around with thread; two ended up in Haghia Triadha (CMS II.6 no. 19), and four in Sklavokambos (CMS II.6 no. 260).

The same ring was used, some 70 or so years earlier, to seal three of the same kinds of documents found at Akrotiri on Thera (CMS V Suppl. 3 no. 391).

These tiny objects form their own inward-looking network, linked by the appearance of the same seal on each sealing, but what does the seal impression signify and why has it travelled through time and space in this way?

They are also one component of a network of communication within and beyond Crete that we are still trying to disentangle; there are three other gold rings used like this to seal parchment documents found across Crete, and this is a very different mode of communication to the mundane Linear A clay administrative documents. What messages might the parchment documents (themselves rarely bigger than 6x6cm) have contained? The gold rings suggest an elite level of communication, and the careful securing of the clay on the folded parchment might indicate a concern with secrecy, but who sent them and from where? Some certainly originate from the area around Knossos, but what does this imply for the role or status of the palace during this period? How much weight



- 3

should such small objects bear in our reconstructions of the past?

### IMPRESSING COMMUNITY: THE AGENCY OF MINIATURE SEAL IMAGERY TO CREATE AND EMBODY SOCIAL NETWORKS

**Abstract author(s):** Langin-Hooper, Stephanie (Southern Methodist University)

**Abstract format:** Oral

Miniaturization is often equated with intimacy. Yet in the complex multicultural society of Hellenistic Babylonia, in which miniature objects proliferated, pleasurable prospects of intimacy with tiny things were carefully cultivated illusions. Rather than inviting user immersion into tiny worlds, miniatures were socially potent because they eluded complete understanding and redirected attention to interactions at life-size scale, and the community networks in which those interactions were integral.

Seals were particularly reliant on such exteriority, as they were only fully functional as half of a seal/impression binary, their permanent fragmentation indexing another object that existed elsewhere in the social environment. The miniature imagery on seals invited close looking, but when deployed as impressions across a Hellenistic Babylonian bulla or tablet, the side-by-side placement of multiple seals called immediate attention to their differing perspective points and relative scales. Rather than offering an entry point to another, tiny world, this jumbled landscape of portrait heads, fantastical creatures, and Greek gods highlighted its own artificial construction as the surface layer of a real-life, human-scale object.

I will argue that these effects of miniaturization and fragmentation were not the unfortunate yet unavoidable result of the practical functionality of seals. Rather, they were advantages – particularly within the rapidly shifting social environment of Hellenistic Babylonia. More than simple mute witnesses to the notable civic events recorded in texts, such as the sales of land or houses, seals created communities through the very act of their use. Through their impressions, seals stabilized and solidified otherwise fleeting moments of community formation, virtually reenacting them both across the minute landscape of the clay surface and the real-world space of social networks through which the tablets and bullae might travel.
- 4

### TINY JARS, BIG QUESTIONS

**Abstract author(s):** Reppo, Monika (University of Tartu)

**Abstract format:** Oral

Initially, the small glass jars, a bit less than 4 cm in height discovered in the collection of Pärnu Museum in Western Estonia, were recorded as unusual for the 17th-18th century period in Estonia. With further research, suspicion arose that they might be products of a local glass factory. As the Estonian glass industry started in the 1620s, the small vessels could potentially help answer some important questions about the advent of the local industry. The simple bluish-green glass jars could very well be made in the region but as of yet, the location of the factory in Pärnu County has not been discovered. The increase in forest glass during the period indicates that there was more glass readily available for Pärnu which could correlate with a nearby factory. But how to use the atypical vessels to learn more about it? This presentation examines the ways these small jars with their typology, composition and context could offer information about a factory which cannot be physically examined.
- 5

### MINUTE OBJECTS WITH IMMENSE SIGNIFICANCE

**Abstract author(s):** Griffiths, Mark (Independent researcher)

**Abstract format:** Oral

One is always drawn to the charm of miniature objects. Do they connect in some way with our inner child, or does miniaturization appear to offer a sense of control of the world? In this context is easy to overlook more practical reasons artefacts from our past have been created in miniature. In my own trade of furniture making small scale maquettes are often created to demonstrate design ideas to clients. Transportable, tactile and far easier to read than a drawing, these diminutive objects are a useful tool of communication between client and artisan.

Traditionally, the crafting of a miniature scale object also marks the transition from low skilled apprentice to the rank of journeyman. These ‘apprentice pieces’ were set as a challenge to demonstrate competence and dexterity in your craft. They encapsulate the transference of skill and knowledge between student and master craftsman. Often made using less expensive materials their scale seems to speak of the humility of the humble apprentice. Early examples of these objects have become highly collectible.

Could a number of the miniature finds from prehistory be markers in networks of trade and learning? Artefacts that speak of a pride in displaying newly acquired skills to an artisanal hierarchy, or objects which demonstrate to others a confidence and command of both material and design?
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### IVORY CARVING IN CHALCOLITHIC IBERIA: DELICATE MANUFACTURES-EXTENSIVE CONNECTIONS

**Abstract author(s):** Lucíañez Triviño, Miriam (University of the Basque Country - UPV/EHU; Eberhard-Karls-Universität Tübingen)

**Abstract format:** Oral

The value of different raw materials has changed throughout history, and is different for each society or human group. However, it seems that ivory has always had great value in the social and cultural spheres since the Paleolithic. There seems to be practical rea-

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sons for this attraction. It is a hard and resistant material but possible to be carved, has uniform color and soft texture, under normal conditions it remains unchanged and compact for a long time and it can be easily polished to give it a glossy and homogeneous finish. Although these criteria are important, it is also possible that ivory, like other raw materials, was characterized during Prehistory by symbolic attributes and more deep meanings. The interest in this material could be linked to its aesthetic and technical qualities, but also to the necessary pre-requisite management for its acquisition and to its rarity or scarcity.

We have carried out the techno-typological, contextual and isotopic study of ivory artifacts from the Chalcolithic site of Valencina-Castilleja (Sevilla, Spain). The ensemble includes a wide variety of artefacts (boxes, handles, combs...), including small figures of acorns and finely worked animals. It is clear that the societies of the past represented their environment and those elements of it that had special value for the community. Perhaps the community of Valencina-Castilleja represented elements of its environment that were especially important for the group (for its economic and/or symbolic value) on a precious and exogenous material such as ivory. The objects themselves, the deposition context, the material (ivory), the way they are fabricated and the decorations have revealed local, regional and long-distance contact networks.
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### JUST ONE OF MANY: A SHAPED WOODEN PALISADE PLANK FROM THE LATE NEOLITHIC

**Abstract author(s):** Kovacik, Joseph (Eveha archéologie; Terrascope Thin Section Slides) - Ferrier, Antoine (Département de l'Aisne) - Poirrier, Sandy - Ravry, Delphine (Eveha archéologie) - Tegel, Willy (Universität Freiburg/Dendronet)

**Abstract format:** Oral

The late Neolithic palisade at La Villeneuve-au-Chatelôt, France was comprised of on the order of 50000 or more oak timber planks, of which N° 2146-128 is typical. While not small – plank 2146-128 measures around 65 cm wide, around 20cm in thickness and while today only 45 cm long, in the neolithic it likely stood 4 or 5m high when in place– in the wider scheme of things this single plank is tiny, insignificant. Through this single plank, however, the palisade itself and the wider social and political networks comprising late neolithic life along the Seine Valley are encapsulated. 3232 BC – who cut the likely thousands of trees, from one of which plank 2146-128 was formed, this year to build the palisade ? How many men and women were needed to transport the thousands of cut trees from the two primary forests to the ancient Seine River to be floated to a location near the site ? The artisan woodworkers who split the logs tangentially – likely the earliest evidence for this technically difficult task in western Europe – were they local or part of a wider network of traveling craftspeople who specialized in the construction of palisades ? How many people, and from where, participated in enclosing the 50 hectares of this site? Plank 2146-128 allows us to see new practices in Europe, such as using rivers to float timber, and the process of tangential splitting. It shows us that forests and the landscapes of sites were not just resources to be exploited, but were organized and managed. Finally, the plank, like the site of La Villeneuve-au-Chatelôt itself, is just one of many.
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### BADGES OF IDENTITY; JEWELS FROM THE TOMBS OF EARLY VASA QUEENS

**Abstract author(s):** Gonzalez, Joseph (California State University, Fullerton)

**Abstract format:** Oral

The investigations of the royal tombs in the cathedral of Uppsala, Sweden, have revealed a variety of jewelry and small precious objects dating from the second half of the sixteenth century. For the purpose of this paper I will focus on two jewels that were found in the tombs of two queens, Margareta Eriksdotter Leijonhufvud (d. 1551), wife of King Gustav Vasa, and Katarina Jagellonica (d. 1583), wife of King Johan III. Close examination of these jewels has provided strong evidence that these objects were worn during these women’s lifetimes and were not produced as part of the traditional set of funerary regalia intended only for use in the grave. Though small in scale, the two jewels provide evidence of economic, cultural, artistic, political, and dynastic connections that stretch across Europe all the way to Asia. Most importantly, the jewels provide insight into the networks by which feminine royal power was constructed, legitimated and sustained.
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### A SHINY BROOCH AND ITS SECRETS

**Abstract author(s):** Pedersen, Unn (University of Oslo) - Kristoffersen, Elna (Universitetet i Stavanger)

**Abstract format:** Oral

This paper demonstrate how important it is to reconcile ornamentation and the technical aspects of production in order to achieve a comprehensive understanding of the craftspeople behind ornamental metalwork, the context in which they worked and the communication they had with their contemporaries. The conclusions are based on a study of an elaborate brooch from the first half of the 6th century AD, an object that expresses a complex symbolic language through an intricate and demanding crafting processes and the use of many exotic materials. Significant observations are that both the brooch and the motifs are the result of work in a variety of materials, and that the brooch took form through work in alternating positive and negative versions. Accordingly, the ornamentation was completely integrated into the object right from its conception, and there is simply no distinction between subject and decoration. A combination of new and old style elements indicates that the craftspeople were among those who transformed motifs with religious connotations. They operated in creative centres of expertise, where legends and myths were created, communicated and developed in various ways, through tangible and intangible expressions.



MINUTE MEMORIES REMEMBERED

**Abstract author(s):** Adams, Sophia (SUERC, University of Glasgow)

**Abstract format:** Oral

Manipulated glass, molten bronze, sculpted wax, hammered iron and grasped fibres. In one tiny Iron Age brooch are gathered the strands of a connected world of imported resources, honed skills and social interaction. The microcosm of Middle Iron Age Britain encapsulated in miniature. Taking the smallest artefact from a chariot burial in Pocklington, East Riding of Yorkshire this paper examines how the study of this tiny brooch reveals a wealth of information about the time and place in which it was made, worn and buried. What can the focussed examination of an individual small artefact reveal about grander questions of movement, mobility and connectivity of ideas, materials and skill.

From one object we see the environment of the past, the social interactions, the challenges and strains of acquiring materials and developing and maintaining skill. It challenges us to ask where the materials came from: the glass, the copper, the tin, the iron; how they were brought together and transformed into this object; why obvious and subtle features were included in the design. By researching these questions we open the single artefact study to an examination of contemporary settlements, patterns of production, mortuary behaviours, local mobility and international movement. From the minute we expand to the vast and complex world of Iron Age Europe with its archaeological challenges from dating remains to interpreting incomplete sites and disconnected evidence. Was this depth of social information intentional in the inclusion of this tiny item in this exceptional grave? Or accidental?

ROUTED ARCHAEOLOGY – ARCHAEOLOGICAL ROUTES AND THEIR IMPACT ON PERCEPTION OF ARCHAEOLOGICAL HERITAGE IN THE LANDSCAPE

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Mele, Marko (Universalmuseum Joanneum) - Fábíán, Szilvia (Hungarian National Museum) - Mihelić, Sanjin (Archaeological Museum Zagreb)

**Format:** Regular session

Archaeology is and always was involved in the landscapes by research and monument protection. At the same time it is also shaping the landscape by interpreting and presenting the often hidden archaeological heritage and making it usable for tourism. Archaeological routes, paths, information boards and monument interpretation tools have been for a long time part of our participating in the modern use of the landscapes and its heritage. In the recent years the new technologies are getting more and more involved in the visualisation and interpretation of archaeological heritage. Digital guides, augmented reality, digital visualisations of monuments are becoming major tools for reaching new younger audiences. How are this analogue and digital interpretation tools compatible? What do users look for in the digital world of archaeology? Do we still need information boards on archaeological trails?

In our session we are looking for contributions presenting newly established trails, routes or interpretations of archaeological monuments for the visitors in the landscapes, open air facilities and museums. A special focus should be on new fresh approaches and the combination of digital and analogue interpretation tools. Also experiences with complex and large transnational cultural routes are very welcome to the session.

ABSTRACTS

1 A WORLD OF ITS OWN – ON CULTURAL AND NATURAL LANDSCAPES OF CULTURAL ROUTES

**Abstract author(s):** Mihelic, Sanjin (Archaeological Museum in Zagreb)

**Abstract format:** Oral

Cultural routes generally function as networks of stakeholders interested in joint management, valorisation and promotion of specific cultural and/or natural phenomena, often covering large distances. The model has gained prominence in the past few decades, particularly following the launch of the Council of Europe’s programme of cultural routes and the certification of the first routes in late 1980s and early 1990s. If we take a look at various levels at which routes can be developed, from local through regional to national and transnational, we shall see that archaeology regularly features quite prominently among the topics on which routes are focused. This paper centres on two main objectives, namely, an appraisal of the archaeological character of several high-profile cultural routes and their management models and, second, the various ways in which different cultural routes tackle the notion of archaeological landscape, using on-site and off-site techniques; traditional and novel approaches, as well as digital and analogue interpretation tools.

2 FROM PAST TO PRESENT: NEANDERTAL LEGACY AS BASIS FOR A CULTURAL ROUTE

**Abstract author(s):** Jankovic, Ivor (Institute for Anthropological Research) - Mihelić, sanjin (Archaeological Museum in Zagreb)

**Abstract format:** Oral

Neandertals are arguably one of the most recognizable populations of the past. As indigenous inhabitants of prehistoric Europe they left their legacy (biological and cultural alike) on numerous sites. The idea of the „Neandertal trail“ lies in re-evaluation of that legacy, not only in scientific sense, but also as a basis for creation of cultural route in which Neandertals are a driving force for a comprehen-

sive cultural-tourist product. The first steps are to be taken in the form of archaeological - cultural trail, connecting three types of „points“: primary points (the archaeological sites), secondary points (museums and presentation sites), and tertiary points (sites of interest along or near the primary and secondary points along the trail, such as natural heritage sites, other cultural sites and many other points and sites of interest). After this cultural trail is established in Croatia, it can easily be incorporated into a pan-European Neandertal trail network.

ARCHAEOLOGICAL ROUTES - NEW OPPORTUNITIES TO EXPLORE HERITAGE

**Abstract author(s):** Byszewska, Agata (Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland)

**Abstract format:** Oral

The relationship between archaeology and tourism, although pleasant, is not easy. Both excessive tourist traffic and anonymity may be a source of danger. It’s clear that effective protection of the archaeological heritage is closely related to high public awareness and knowledge about heritage. The solution may be thematic - archaeological tourism combining the knowledge with pleasure. In order to meet this social interest, a web portal has been developed, which provides information about monuments in a modern, attractive way. The users have access to information about 80,000 monuments, which can be grouped in any way according to tourists interests and needs. Using the Google Maps mechanism, the users can easily identify all the objects, find their way to the monument using a mobile device. The users are not only a passive recipients of information. They can plan their trips using various means of transport (hike, bicycle, car), its duration, publish the trip on the portal or use GPS navigation between subsequent points of the trail.

The involvement of the portal user is not limited just to the planning of excursions. Everyone can influence its shape by adding additional information, photos or completely new objects. There is also a possibility to react – one may use the mechanism of reporting directly to the conservator of various threats related to monuments (select the type of threat, add a description and photos). The information is sent to the appropriate local conservator automatically and allows for faster response to potential threats.

This service, also available in a mobile version, is an example of compatibility between analogue and digital tools popularising knowledge about heritage and learning about it in a sustainable way. It creates awareness about the needs of protection of archaeological heritage while having a direct access to it.

FROM AN EU-PROJECT TO A CULTURAL ROUTE – A STONY WAY

**Abstract author(s):** Mele, Marko (Universalmuseum Joanneum)

**Abstract format:** Oral

The Iron-Age-Danube project started in 2017 as one of the projects co-financed by the Interreg Danube Transnational programme. It connected 20 partners and associated partners from 5 countries in the Danube region in their pursuit for research, protection and presentation of Iron Age landscapes. In three years the project produced joint strategies, scientific and methodological publications, joint promotion events and digital tools for visitors. The project became in 2018 also a finalist of the ReioStars awards.

In the last year of the project an analysis of the Danube region was made by the Routes4U project, which suggested a development of an Iron-Age-Danube route. The Route should in 2020 start the procedure of the certification by the European Council. In my paper I would like to discuss the procedures and the structure needed to create and upkeep such transnational touristic route. Not only the structural needs, but also the financial expectations will be in the focus of the paper.

POSSIBILITIES OF ROUTE-BASED TOURISM DEVELOPMENT IN THE DANUBE BEND REGION

**Abstract author(s):** Fejer, Eszter (Freie Universität Berlin; Eötvös Loránd University FH IAS) - Czifra, Szabolcs (Hungarian National Museum DAHP) - Novinszki-Groma, Katalin (Eötvös Loránd University FH IAS) - Fábíán, Szilvia (Hungarian National Museum DAHP) - Pálinkás, Adrienn (Hungarian National Museum DAHP; Universalmuseum Joanneum Graz)

**Abstract format:** Oral

In recent decades tourism and culture have become inextricably linked partly due to the increased interest in culture, the easier accessibility of cultural assets and experiences and further due the general growth of tourism. Recognizing the synergies between these two sectors, heritage tourism plays a significant role in European programmes, too. Accordingly, in addition to obvious scientific aims one of the main goals of the EU funded Iron-Age-Danube project (2017-2019) was to establish revitalization strategies for selected prehistoric sites in order to raise awareness on monumentalized Early Iron Age landscapes. The strategies involved the preparation of archaeological trails in the targeted microregions to offer additional programs and attractions, therefore possibly evoking the interest of new target groups. As the Iron-Age-Danube route-network became a candidate for the Cultural Route programme of the Council of Europe, this paper aims to explore the potential of the route-based heritage tourism, especially focusing on the Danube Bend region (N Hungary). Beside the project-related Süttő microregion, which is known in the scientific community mostly for its Early Iron Age burial mounds, Esztergom, the largest town of the area, which is rich in archaeological and historical heritage, is incorporated as well. Although the Danube Bend region attracts a lot of tourists visiting mainly the nature parks, who gravitate to Esztergom, there is still a great potential in heritage-based tourism development. The paper summarizes the actual steps done so far in the IAD project and the planned actions in connection with the thematic route development. Further the paper draws a critical summary on the characteristics of the Danube Bend region’s tourism in order to answer the ultimate question: is there any chance to add innovative tourism attractions to the market still dominated by traditional products?

6	<p><b>IN VINO VERITAS: HERITAGE ROUTES AND THE SPATIAL NARRATIVES OF VITICULTURE AND CIVILISATION</b></p> <p><b>Abstract author(s):</b> Hanscam, Emily - Witcher, Robert (Durham University)</p> <p><b>Abstract format:</b> Oral</p> <p>Long-distance footpaths and routes are increasingly promoted to link together (sometimes loosely) related heritage sites, to increase tourism and to nurture cultural knowledge and understanding. Some offer the opportunity to walk ancient routes, following the footsteps of past people (e.g. parts of the Frontiers of the Roman Empire World Heritage Site). Others offer different means of engaging sensorily with the past, for example, through taste. In recent years, a number of wine-themed trails and routes have been promoted across Europe, interweaving landscape, archaeology, gastronomy and oenophilia to promote new experiences for visitors and local communities alike. A link with the Roman period, especially in western and south-eastern Europe, is particularly noticeable, reflecting narratives around the instrumental role of empire in the transmission and adoption of viticulture and wine consumption in the Roman provinces. Here, we examine a sample of these heritage routes and examine the cultural values intentionally and implicitly associated with them. These include notions of civilisation and ancestry, and embody global/local tensions within both ancient and modern economies and identities. We consider how transnational routes, in particular, serve to define spatial narratives that reflect temporal, sensorial and ecological connectivities. For example, the ‘Roman Emperors and the Danube Wine Route’ was certified as a cultural route of the Council of Europe in 2015. This route links the presence of the Roman army on the frontier to the consumption of wine in the regions adjacent to the Danube, connecting archaeological sites to the history of wine consumption and Roman ‘civilisation’ in Hungary, Croatia, Serbia, Romania and Bulgaria. Extending across regions divided by very different national traditions and narratives, this transnational initiative finds commonalities around a shared historical moment, materialised through sites such as Sirmium, Sarmizegetusa and Histria, and experienced via shared cultural tastes, such as wine drinking.</p>
7	<p><b>CHALLENGING PUBLIC PERCEPTIONS ON UPLAND LANDSCAPES IN BABIA (LEÓN, SPAIN): THE DISSEMINATION OF ARCHAEOLOGICAL RESEARCH THROUGH HIKING ROUTES</b></p> <p><b>Abstract author(s):</b> Gonzalez Alvarez, David (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC)</p> <p><b>Abstract format:</b> Oral</p> <p>Since 2017 we are conducting archaeological research in the mountainous region of Babia (León, Spain). This area is comprised by the Natural Park of Babia and Luna, and the UNESCO Babia Biosphere Reserve. Our project aims to examine human agency in the diachronic shaping of upland landscapes. The anthropogenic impact of pastoralism, mining or forestry is a relevant theme under discussion in current archaeological research at several European mountain ranges. Traditionally considered as ‘marginal areas’, recent archaeological investigations reveal how upland environs constitute key areas to understand subsistence strategies developed by societies at different historical periods. Thus, previous assumptions about mountains being ‘pristine areas’ where wilderness has prevailed against long-term anthropization can be nowadays challenged. Although these assumptions are well-established in social sciences, tourism imaginaries and narratives disseminated by different stakeholders still tell broader audiences that upland landscapes are beautiful because human presence can be barely noted. When mentioned, herding or forestry activities are presented in an unhistorical and unproblematic framework adopting a melancholic tone. In this paper, we analyse prevalent narratives regarding cultural landscapes along hiking routes and museums in our study area. We will also explore tourism narratives on cultural heritage disseminated by public and private stakeholders aimed to attract visitors to the study area. Moreover, we present the dissemination plan we are following as a result of our research project, including the redesign of existing hiking routes, the placement of new interpretative panels for visitors, the production of brochures and materials for lay audiences, educational activities with children, and an active public engagement strategy through Social Media, public lectures and visits. Overall, we will assess our successes and the challenges ahead.</p>
8	<p><b>WALKING AND STUMBLING ON THE PATHS OF HERITAGE-MAKING FOR RURAL DEVELOPMENT IN THE ARICA HIGHLANDS</b></p> <p><b>Abstract author(s):</b> Saintenoy, Thibault (Incipit-CSiC)</p> <p><b>Abstract format:</b> Oral</p> <p>To reflect on the potential of the Cultural Route heritage category as an instrument for cultural revitalization and community strengthening in highland regions, we analyze an interaction of actors involved in the co-construction of a hiking circuit in northern Chile that succeeded in its heritage-based design but not in its touristic implementation. Based on an in-depth analysis of the socioterritorial context and on participatory action research carried out to design the circuit, we discuss the reasons for the project’s failure during the phase of community-based tourism model definition. This leads to broader conclusions on the intersections of current policies on heritage, multiculturalism, and environment, relating to the 2014 inscription of the Qhapaq ñan Andean road system on the World Heritage List. Finally, we highlight 3 lessons: (1) the need to clarify the risk of confusion between cultural revitalization and cultural tourism; (2) the Cultural Route category as a complex and heterogeneous heritage construct that is difficult to apply from global to local scales, and (3) the need to further develop Latin American regulations on heritage.</p>

9	<p><b>ARCHAEOBALT - LAYING FIXED FOUNDATIONS FOR INNOVATIVE ARCHAEOTOURISM - A NEW “GREEN” ARCHAEOROUTE IN THE SOUTHERN BALTIC SEA REGION</b></p> <p><b>Abstract author(s):</b> Czonstke, Karolina (University of Gdańsk; Archaeological Museum in Gdańsk) - Świątkowski, Bartosz (University of Gdańsk)</p> <p><b>Abstract format:</b> Oral</p> <p>Archaeological heritage is fascinating and is giving many opportunities to spend attractively free time. Especially now, when the global touristic trends move towards the idea of 3E (entertainment, excitement, education ) and wellbeing tourism. Archaeotourism is a perfect alternative. The question is about the proper balance between the protection of archaeological heritage and expectations of the touristic trade. In the Baltic Sea region, the touristic potential of archaeological heritage is not fully used.</p> <p>The ArchaeoBalt is a three-year project implemented by the University of Gdańsk, University of Aarhus, University of Lund, Museum of Bornholm and Museum of Gdańsk.</p> <p>The project aims to uncover a new way of promoting our joint cultural heritage through many activities, which will boost the tourist exchange in South Baltic Sea Region by creating a new brand – sustainable green and blue Archaeotourism.</p> <p>Creating archaeoroute “Place of power and rituals” links such unique archaeological sites like Sorte Muld, Smørengegård (Bornholm, Denmark), Uppåkra (Lund, Sweden), Wiśłoujście Fortress (Gdańsk, Poland), Stronghold in Owidz (Starogard, Poland), via cultural-educational activities and events.</p>
10	<p><b>SIGNS AND SYMBOLS OF JERUSALEM ALONG MEDIEVAL PILGRIMS ROUTES: FROM ARCHAEOLOGY TO VALORIZATION</b></p> <p><b>Abstract author(s):</b> Salvarani, Renata (European University of Rome; International Association for History of Religions)</p> <p><b>Abstract format:</b> Oral</p> <p>The imago of Jerusalem is a constitutional element in the Christian cultures across Europe in Medieval centuries. Religious and memorial aspects related with the places of the Passion, Death and Resurrection of Jesus overlap with liturgical, symbolic, spatial and architectural implications.</p> <p>The Holy City became a dynamic tool interacting in the creation of mental representations and cultural landscapes in the context of the general process of building of meaning and of semantization of the space. For thousands of people the pilgrimage has been the very experience where they elaborated a consciousness of belonging both to the Christian oicumene and to a larger World.</p> <p>Witnesses of these historical processes provided by documental, literary and liturgical sources have been the object of several significant studies, whereas material sources still wait for a composition in a general unique interpretative framework.</p> <p>Today, can archaeological remains testify the processes of building of religious ideas and cultural landscapes? In our contemporary society can symbols, buildings and material structures emerging along historical routes can contribute to clarify cultural and identity general processes?</p> <p>This paper try to draw a critical answer focusing on cultural routes networks crossing Mediterranean Europe, particularly the Italian peninsula, and on urban ports of departure to the Levant (Via Francigena, Via Romea, Via Germanica).</p> <p>Architectural and devotional imitations of Jerusalem and of the Holy Sepulchre will be connected with general historical phenomena, with the processes of building cultural landscapes and will be presented as contemporary nodes of visit networks.</p> <p>Some specific artifacts and architectures (such as hostels and xenodochia, representations of Jerusalem, images of saints and pilgrims, etc.) will be analyzed as well.</p> <p>Historical religious pathways will be assumed both as an interpretative key to understand general cultural transformations involving the whole society and as occasions to foster valorization actions based on archaeological heritage.</p>

309	<p><b>BREAKING THE SPELL: RE-EVALUATION OF MEMORY DEVICES IN THE CARPATHIAN BASIN</b></p> <p><b>Theme:</b> 6. Embedded in European archaeology: the Carpathian Basin</p> <p><b>Organisers:</b> Uhl, Regina Anna (Leipzig University) - Urák, Malvinka (National Museum for Transylvanian History)</p> <p><b>Format:</b> Discussion session (with formal abstracts)</p> <p>Vreau să cred - I want to believe” was the name of an exhibition that has recently been displayed in the National Museum for Transylvanian History in Cluj-Napoca. It sums up the research history of the tablets from Tărtăria and further finds of round clay tablets with notches and impressed lines. Despite a reasonable bias concerning the credibility, whether or whether not some depictions might be fraud, several researchers treated especially the objects from Tărtăria rather apodictically as proof for the earliest writing in Europe – without further contextualization such objects indeed rather resemble a question of believe.</p> <p>What was claimed here, between the lines, is an alternative track of evolution of complex societies in the Carpathian Basin, which unfortunately, lacks a critical examination of further circumstances that come with or before early developments in writing. In the course of changing modes of production and further technological advances with new materials and expanding communication networks, a clustering of social complexity comes with the demand for regulative mechanisms within the societies and beyond. One out of several aspects of these regulative objections finds its material manifestation in memory devices such as tokens, clay discs,</p>
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tally sticks or possible stamps. Even miniatures of objects or animals may be linked to that sphere. By storing information, these objects open up a wide field for counting, registering and keeping track of transactions.

We would like to re-evaluate and re-contextualize the range of these enigmatic objects from Chalcolithic and Neolithic sites. The main geographic focus shall be the Carpathian Basin; as well, comparative studies with neighboring regions and from a wide range of disciplines are very welcome to join the workshop and to break the spell of the “Tărtăria-Paradigma”.

ABSTRACTS

1 MATERIALIZED SIGNS AND SEMIOTIC SYSTEMS IN THE NEOLITHIC? EVIDENCE FROM GREECE

**Abstract author(s):** Marangou, Christina (Independent researcher)

**Abstract format:** Oral

“The paper considers two rare categories of Neolithic clay finds from Greece: small objects of unknown function, of more or less geometric forms, described as tokens, disks, “roundels”, “ear-studs”, rings, tablets, or tallies - some of which bearing incised marks or notches; and utilitarian or symbolic artefacts, such as spindle whorls or miniature vases, displaying incised linear “signs”, isolated or in groups, occasionally subdivided into clusters, exceptionally combined to possible iconographic patterns. The rareness of both categories could be due in part to identification difficulties and uncertainties, to frequently insufficient descriptions or to lacking illustrations in publications, but also to a possible use of natural items (e.g. pebbles) and a non-preservation of objects in organic materials.

According to scarce contextual information, such finds have been discovered isolated or in small sets, larger groups being rather exceptional. Connection to everyday tasks, but also to possible symbolic functions is implied, a coexistence of both a utilitarian purpose and a symbolic value being sometimes conceivable in a duality of functions.

Some hypotheses on the interpretation of these objects are considered. It has mostly been suggested that they were used as memory devices for storing information: material aids could in fact be necessary in oral societies for the memorization of information, for the transmission of collective, traditional knowledge, for the notation of rhythms, for recording, counting, measurement or narration, for ritual or play. Sign systems of communication might have been used collectively or limited to specific groups, households or individuals. It is to be debated whether they were connected to specific tasks or/and to other semiotic or symbolic systems used by prehistoric societies.

2 COUNTING AND REGISTERING IN THE 4TH MIL BC IN EASTERN EUROPE?

**Abstract author(s):** Uhl, Regina Anna (University Leipzig)

**Abstract format:** Oral

This paper focuses mainly so called tokens and further, enigmatic clay objects from sites in the north-western pontic area. They show a wide variety of forms like simple spheres, cones, rectangles, oval shapes or triangles. Also schematic animal figurines and clay images of furniture might belong to this group.

Very often, these objects are treated as magically charged objects or rather apodictically receive a mere religious connotation. But due to their find contexts, whereupon the clay tokens are associated with tally sticks, clay breads (pâini/ хлібці), large quantities of bones and broken zoomorphic miniatures, it seems plausible to regard them as memory devices. Especially the imprinted notches on the broken tally sticks imply that those objects shall be contextualized in a sphere of counting or registering, as can be assumed as well for a similar range of items from several regions in Greater Mesopotamia.

Especially for Eastern Europe, this interpretation seems to be something new and it shall be discussed, whether we can speak of early forms of registering and/ or counting devices. In general, it must be scrutinized, in how far we can trace exchange of goods and at which dimension these exchange networks use the same symbols with the same meaning.

313 MEDIEVAL MARKET ARCHAEOLOGIES: METHODS, CASES AND CONCEPTS

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Rösch, Felix (Georg-August Universität Göttingen) - Tys, Dries (Vrije Universiteit Brussel) - Kalmring, Sven (Zentrum für Baltische und Skandinavische Archäologie)

**Format:** Regular session

The marketplace is among the most iconic features of the medieval town; nevertheless, due to their specific biographies they are rarely considered or studied in medieval archaeology.

Urban planning and redevelopment measures in the last 20–30 years have led to a significant increase of marketplace excavations. The results of these excavations, however, were most often not subjected to scientific research, so that we are still unsure how marketplaces developed, how they were designed and when, and how they functioned in detail. And, what is the sense of place regarding ‘markets’, or, what does it mean to ‘hold a market’ from a material habitus perspective?

In this session, we want to address questions relating to the origins of the concept of market places and what it meant to hold a

market in the earlier centuries of the Middle Ages, where the picture is rather blurry. Written sources mention street markets, beach markets, markets at harbours and more often market rights. But what is their archaeological reality? Can we indeed transport the market concept from the later medieval period to the phase of portus towns and wics?

By the 13th century at the latest, almost every European town had at least one central market square. We will discuss how, and why, this successful model that changed the topography of many towns appeared almost everywhere.

We also want to address how different markets functioned, i.e. what practices were undertaken and which actors were present. This calls for new methods that have the potential to reveal yet unknown actions and voiceless actors.

The aim of the session is to gather concepts, approaches, methods and significant case studies on the field, to establish an Archaeology of Medieval Markets.

ABSTRACTS

1 FROM BEACH- TO HARBOUR MARKETS. ARENAS OF TRADE PRIOR TO MARKET SQUARES

**Abstract author(s):** Kalmring, Sven (Centre for Baltic and Scandinavian Archaeology)

**Abstract format:** Oral

In the Scandinavian Seascape waterborne traffic was essential. With the need for regular stopovers a dense network of minor landing sites developed along the coasts, roughly at a distance of around a day’s rowing (6 vikur = 36 nautical miles). These landing site-networks were studied in greater detail for the island of Fyn, the Roskilde fjord on Zealand and the island of Gotland in the Baltic. Amongst many other functions, some of these landing sites even fulfilled a function as “trade and craft sites” or plainly as seasonal beach markets. Some of them, possibly due to Royal stimulation, developed eventually into early towns with trade throughout the year; a step which cannot be underestimated since market trade otherwise was mainly connected to fairs at thing-assemblies only. By the end of the 9th century AD, on the background of consolidating Royal powers and the protection of sea passages against piracy, pure trading vessels could develop. The latter not only could transport far greater quantities of bulk cargo to the new urban communities, but – due to an increased draught – required a mooring afloat as a result of their displacement tonnage. Former beach markets at landing sites had thus to make way for proper harbour facilities. As the case-study Hedeby illustrates, the beach markets were relocated onto the jetties literally forming a platform for market trade. For Northern Europe it should take until the first half of the 13th century AD that harbour markets were replaced by Medieval market squares.

2 PORTS AND MARKETPLACES

**Abstract author(s):** Rösch, Felix (University of Göttingen, Seminar für UFG)

**Abstract format:** Oral

This paper focusses on the particular trading space of ports, which underwent their own development due to the specific conditions of merchant seafaring. The development of those marketplaces will be presented chronologically in three time periods and focus on specific characteristics as well as general features.

For the Early Middle Ages the emporia and other trading ports in the North Sea and the Baltic with beach and harbour markets will be discussed. During the High Middle Ages a commercial optimisation can be registered at the waterfronts, which is strongly linked to the professionalisation of merchant seafaring. On the one hand, public harbour markets were established in the ports, while on the other hand, private and individually developed commercial properties appeared. From the late 12th century onwards, we can discern both a change and a diversification. The harbours lost their market function, while long-distance trade shifted to the houses of the merchants inside the town. Furthermore, central marketplaces were established to ensure the supply of the local population.

3 THE CENTRAL TOWN SQUARE IN MEDIEVAL TOWNS IN THE (SOUTHERN) LOW COUNTRIES: URBAN LIFE, FORM AND IDENTITY

**Abstract author(s):** Tys, Dries (Vrije Universiteit Brussel)

**Abstract format:** Oral

The central town squares of the medieval towns in the Low Countries are considered to be the theatres of late-medieval urban identity and are not rarely associated with the origin of the towns, or at least their glory as merchant towns in the past. In reality, these emblematic places have often complex biographies, in which selected memories were attributed to them in different historical contexts. In this paper, we will explore how these changing townscapes interacted with the social agents at their medieval origins. We will use both archaeological data as historical writings in order to reconstruct their biographies and show how their development was not path-dependent but followed deliberate strategies and aims by different actors that used this space.

Whereas the symbolic interpretation has focussed so far on the symbolic aspect and sense of place following Henri Lefebvre, the square also reflects the complex evolution of the urban market, both in the spatial and in the economic sense. Geoarchaeological research shows the complexity of the deposits anterior to the embellished town squares of the late medieval period. These deposits tell a story of the lesser known phases, such as the feudal phase of the market, and the link between the early medieval trade and exchange patterns and the start of urbanisation in Early Medieval Europe.



4 THE DIVERSITY OF THE MEDIEVAL TOWN SQUARE

**Abstract author(s):** Renn, Lisa (Albert-Ludwigs-Universität Freiburg; Zentrum für Kulturwissenschaftliche Forschung Lübeck - ZKFL)

**Abstract format:** Oral

Market and town square – these terms are not easily separated as they dominate how we look upon a central square in a medieval town: it is the market square! You cannot think one without the other. But by concentrating on the town square as an urban phenomenon itself, a more differentiated and diverse picture can be won. We may find that town squares and markets form an intimate connection, but a town square is much more than that. By concentrating on its development, appearance and functions, this central part of the town structure can give important insights into the town's development and structure as well as a reflection of the economic, social and political changes in the town. Shifts in importance and perception concerning this urban feature can also be traced, giving a picture of the social, physical and functional dynamics in the town itself. And by comparing different central squares, common developments or unique regional traits can be presented.

In this paper I would like to concentrate on the diversity of the town square by presenting two case studies, each describing a different development and therefore a different impact on the town's topography. In Lübeck, northern Germany, the central square was laid out during the foundation of the city and served as market square from the end of the 12th century onward. In contrast, the central square in Freiburg, southern Germany, was subsequently constructed by tearing down existing city blocks, but not for creating a marketplace, as the market concentrated on other parts of the city. By comparing these towns not only can we trace different developments and designs of town squares but also a different perception of how and where a market should take place in a town. So, are markets and town squares necessarily bound together?

5 THE ARCHAEOLOGY OF MEDIEVAL MARKETPLACES IN CENTRAL HUNGARY

**Abstract author(s):** Kolláth, Ágnes (Institute of Archaeology, Research Centre for the Humanities) - Herbst, Anna (Ferenczy Museum Centre, Szentendre) - Kovács, Bianka (Institute of Archaeology, Research Centre for the Humanities) - Mordovin, Maxim (Eötvös Loránd University, Institute of Archaeological Sciences) - Tomka, Gábor (Hungarian National Museum)

**Abstract format:** Oral

The opportunity to reconstruct their main squares emerged for the municipalities of numerous Hungarian towns in the last decades, which has made preliminary excavations and archaeological supervision necessary.

We would like to present the medieval marketplaces' main characteristics based on these results, in a well definable group of settlements in the north-eastern part of the so-called Transdanubian region in central Hungary (mainly Győr, Pápa, Tata and Székesfehérvár). All of these towns had had strong relations to the king, as seats of power, royal or courtly estates since the 10th -11th centuries. Their trading and social connections with each other have also been documented through this era and every one of them reached a varying level of urbanisation by the Late Middle Ages.

The establishment of their market squares – usually during the 13th-14th centuries – was definitely a milestone in this process and marked the demise of the highly dispersed settlement structure typical in the first centuries of the Hungarian state.

We would also like to examine the further development of these marketplaces, the changes in their size, the typical buildings and institutions connected to them, closing our timeline in the middle of the 16th century, when the impending Turkish wars changed severely the priorities of urban planning.

6 THE CERAMICS OF THE MEDIEVAL MARKETPLACE OF STENDAL (MARCH OF BRANDENBURG) AND THE EVIDENTIAL VALUE ON EARLY DISTANT TRADING

**Abstract author(s):** Feike, Timo (University of Halle)

**Abstract format:** Oral

The later hanse town of Stendal was the very first place which gained the Magdeburg rights in 1160 and was granted the rights to hold markets. The marketplace was established on open field without any former bigger usage of this place. But smaller rural settlements were located nearby which maybe had some older trade structures before.

Just a few years later in 1188 a market hall was mentioned. Due to dendrochronological dates and diplomatic sources most of the features could be dated to the 12th to early 14th century, the phase of rise and growth of the town. At the end of the 15th century Stendal was a prospering hub of cloth trading and the biggest and wealthiest town of the March of Brandenburg.

It was excavated for more than a third in 2016 by Manfred Böhme who doctorates about the features. Simultaneously the amount of nearly 10000 shards of ceramic were reappraised by the speaker in his master thesis.

The focus of this work was to provide a template of local and regional ceramics – mostly hard fired earthenware. Until today there's a lack of works on medieval ceramics of the region of the Altmark.

Beneath this over 200 fragments of early glazed wares were excavated. They were often used as a sign of wealth and were regularly found in central and eastern Germany even in small town milieu.

In Stendal they are often highly decorated (particularly French and Flemish fabrics) and could be seen as an indicator of early distant trading. There are also less lavish produced ones. This shards could be easily the result of a regional kiln site. All in all enough frag-

ments were found and are redirected to features to give some evidence of trade and its development.

7 PLACES ASSOCIATED WITH TRADE AND EXCHANGE IN PRE-URBAN CENTRES IN THE AREA OF SILESIA (POLISH LANDS)

**Abstract author(s):** Pankiewicz, Aleksandra (University of Wroclaw)

**Abstract format:** Oral

This paper concerns the problem of the possibility of locating places related to trade and exchange within pre-urban centres in the 10th to the early 13th century in Silesia (Polish lands). An attempt will be made to answer the question which indicators of material culture can be used to locate markets and other places of exchange. Attention will be drawn to the relationship between finds related to trade and exchange with other manifestations of economic activity (e.g. non-ferrous metallurgy).

Another problem is whether markets functioned within strongholds or outside them. The existence of such places outside the fortified areas is indicated by written sources and also conditioned by organizational nature (tight settlement buildings and complicated ownership relations). On the other hand, archaeological finds point to the existence of trade-related places also within strongholds. It is therefore assumed that such an exchange existed but was of an ad-hoc and seasonal nature.

Both the appearance of the markets and their disappearance within the pre-urban centres is closely related to the economic and legislative changes that took place in the period from the 10th to the 13th century.

8 THE MICROMORPHOLOGY OF MARKETS

**Abstract author(s):** Wouters, Barbora (Maritime Cultures Research Institute)

**Abstract format:** Oral

Market places in medieval towns in Northwestern Europe are often imagined as theatres of late medieval urban identity. They tend to be associated with the origins of these centres, and with their glory as past merchant towns. In reality, market places are emblematic spaces that exhibit complex biographies with changing functions, layouts, and diverse origins. Through the application of geoarchaeological analysis and the generation of new data, a number of existing narratives on town and market formation can be challenged. A reconstruction of their biographies shows that their development did not necessarily follow set, teleological patterns.

Geoarchaeological methods, such as micromorphology and geochemistry, have a strong potential to contribute new datasets to the study of complex sites such as market places. For sites where excavations are no longer possible, they offer a way to bypass the constant re-evaluation of the same material and written evidence. However, only in the last decade have they become more common in the study of towns in the Low Countries and Scandinavia, important regions for (early) medieval urbanisation. This talk presents a number of case studies to illustrate different concepts of how market places evolved, and of what a market was, or could be.

9 FROM PIT HOUSE TO OPEN SPACE. THE MARKETPLACES OF HALBERSTADT

**Abstract author(s):** Schoo, Tobias (Martin-Luther-University Halle-Wittenberg)

**Abstract format:** Oral

The centre of Halberstadt (Harz County in Saxony-Anhalt, Germany) presented itself to the late medieval viewer as a three-part ensemble (consisting of two marketplaces and a town hall). In the west there was the so-called wood market (1275 AD mentioned for the first time under this name), which was followed up by the fish market to the east (1478 AD first mentioned). Both marketplaces were separated from each other by the town hall, which was completed by the end of the 14th century.

But the history of marketplaces in Halberstadt is much older. The right to hold markets was granted to the bishops of Halberstadt as early as 989 AD and written sources on the structural design of the marketplace are known since the late 12th century.

Archaeological excavations, which were carried out in the 1990s, revealed several layers of marketplace pavements. Additionally they have shown that older medieval traces of settlement (for example various pit houses) can be found under the later open spaces of both marketplaces. Here we grasp a transformation process in which a formerly populated area in the middle of the city was remodelled into a temporarily inhabited centre for trading.

In my presentation I aim to retrace the development of both marketplaces of Halberstadt and highlight the special characteristics of the market ensemble.

10 THE DEVELOPMENT OF THE MARKETPLACE AT PÁPA (HUNGARY)

**Abstract author(s):** Mordovin, Maxim (Eötvös Loránd University, Institute of Archaeological Sciences) - Kolláth, Ágnes (Institute of Archaeology, Research Centre for the Humanities) - Herbst, Anna (Ferenczy Museum Centre, Szentendre)

**Abstract format:** Oral

Before the rescue excavations carried out in 2010-11, the town of Pápa in Western Hungary was among many similar sites with almost unknown early history. The written sources to a quite limited extent gave an image of a pre-urban settlement emerged not later than late 12th century (the earliest mention of Pápa is from 1214). This settlement must have developed into an oppidum before the mid-14th century according to another charter. However, nothing was known or could have been presumed about the physical and topographical appearance of the town, nor about its development until the 16th-17th centuries.

The excavations at the central Market Square of the town have exceeded our expectations. First of all, the known history of the settlement was prolonged by at least two centuries after the discovery of the 10th-11th-century layers. This rural-type settlement was suddenly - in historical terms - transformed into a more urban place with creating a paved market on the turn of the 13th or the beginning of the 14th century. The market of the already urban settlement was transformed significantly two more times until the end of the Middle Ages. In the late 14th century the territory of the graveyard around the parish church was decreased, and half a century later when the population within the walls become too dense, some new timber-framed houses were constructed on the newly designated parcels on the market. The next radical transformation of the topography of the square took place after a heavy siege in the late 16th century.

a. **THE MEDIEVAL MARKETPLACE OF STENDAL (MARCH OF BRANDENBURG) AND ONE OF THE OLDEST MARKET HALLS NORTH OF THE ALPS**

**Abstract author(s):** Feike, Timo - Böhme, Manfred (University of Halle)

**Abstract format:** Poster

Stendal was the first market founded after the Magdeburg rights in 1160 by Albert I. of Brandenburg. The marketplace was established near small rural settlements but in absence of more important central places.

The foundation of Stendal has to be considered as very successful. In 1188 a market hall was mentioned and the town itself developed during the following centuries to an important hub of cloth trading and in the end of the 15th century Stendal can be stated as the biggest and wealthiest town of the March of Brandenburg measuring more than 80 hectares.

Due to the good conservation of the town compared to other city's like Magdeburg archaeological activities and excavations weren't able in a bigger scale until the 2010s. First excavations near the marketplace took place and refers to the mentioned market hall of 1188 for the first time.

In 2016 during the excavation by Manfred Böhme the market hall was finally recorded in its full measures. Dendrochronological dates and numerous construction features show the evidence of one of the oldest profane brick buildings in the Altmark and one of the first market halls north of the Alps.

Besides the market hall there were plenty of other wooden construction features on the marketplace which can show us proof of its appearance during the first years and in later times. A completely preserved wooden floor of a market stall can serve as another example.

The finds can give us also a good insight of the usage. In addition to the ceramics which were presented in another contribution by the author several organic finds show us details of trade but also of production.

Therefore, the marketplace of Stendal can apply as an interesting and well recorded example of a high medieval marketplace in the northern parts of today's Saxony-Anhalt.

**314 SENSITIZING AND ENGAGING THE PUBLIC: THE ROLE OF ONLINE LEARNING IN ARCHAEOLOGY AND HERITAGE EDUCATION**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Fonseca, Sofia (Teiduma, Consultancy on Heritage and Culture; German Archaeological Institute) - Basterrechea, Aurelia (ArchaeoConcept) - Thomas, Ben (Archaeological Institute of America)

**Format:** Regular session

With millions of people joining online platforms all over the world, online learning has become an important educational tool. Online learning is accessible to a wide audience and is a way to engage in continuous learning regardless of age, geographic location, or prior experience. Furthermore, it democratizes education and knowledge. If one wants to learn something, there is likely an online course on it and that course may be presented by leading topic specialists who otherwise may not be accessible.

So, are archaeology and heritage education represented in the world of online learning? A quick internet survey finds archaeological and heritage themed MOOCs, classroom activities, lectures, and a variety of other resources that would indicate that indeed we are online. The presence of these resources, however, raises several issues and questions: Are MOOCs and lesson plans sufficient? Do the online resources accurately portray archaeology and heritage? Do they adequately raise awareness of heritage concerns?

Also of concern is the issue of who produces online content. Archaeologists generally are not trained in non-academic communication. Institutions like museums and research centers are investing in various online communication strategies—YouTube, virtual exhibitions, Instagram, Twitter, etc.—but engaging with the public has moved beyond the professional context. For several years, non-specialist “influencers” have been developing channels and strategies to promote historical subjects. How should archaeologists position themselves in relation to this phenomenon?

In this session we would like to discuss the role of online education in sensitizing people to archaeology and heritage and in promoting archaeological and heritage awareness. What is the responsibility and role of institutions and independent scientists in this new way of communicating science? What are the limits of such formats of communication? We invite archaeologists and heritage educators from around the world to provide examples, insights, and questions to enrich the discussion.

**ABSTRACTS**

**1 FROM INTERACTIVE DIGS TO MYSTERY CEMETERIES: THE ROLE OF AIA’S ELECTRONIC RESOURCES IN ENGAGING AND EDUCATING THE PUBLIC**

**Abstract author(s):** Thomas, Ben (Archaeological Institute of America)

**Abstract format:** Oral

Since its founding in 1879, the Archaeological Institute of America (AIA) has included informing and educating the public about archaeology and archaeological discoveries in its mission. Over the years, the AIA has utilized a variety of methods to communicate with the public. Some of the Institute’s more successful and enduring efforts have included publications like Archaeology magazine and the American Journal of Archaeology and outreach programs like the Lecture Program that each year sends approximately 100 lecturers to provide around 250 lectures to the AIA’s local societies. In addition to these enduring and popular programs, the Institute has significantly increased its digital and electronic outreach over the years. Electronic dissemination of information has quickly become the AIA’s most wide-reaching and impactful outreach. AIA publications now have digital avatars. Electronic newsletters have replaced paper ones and most significantly, AIA websites are being viewed each year by millions of people around the world. Additionally, social media has become the Institute’s primary point of contact with the public and the main driver of people to the AIA’s electronic resources.

In addition to digital publications, AIA electronic resources include videos, interactive digs, International Archaeology Day listings and stories, lesson plans and other materials for educators and students, stories from our site preservation programs, and much more. Most of the content is produced by archaeologists and much of our educational resources are created by professional educators with archaeological backgrounds. In this paper I will use a specific activity—the mystery cemetery project—to anchor a discussion of AIA’s electronic resources, their creation and distribution, and their impact. I particularly want to bring forward issues of flexibility and adaptability of archaeological resources to the variety of ways in which they may be used by the people who access the materials.

**2 SITE OF THE MONTH, AN ONLINE STRATEGY TO HAVE THE PAST OF SWITZERLAND DISCOVERED**

**Abstract author(s):** Basterrechea, Aurélia (ArchaeoConcept; ArchaeoTourism)

**Abstract format:** Oral

The “Site of the Month” program is an archaeotourism project which aims to have people discover one archaeological site in Switzerland each month. Between 2015 and 2017, seventeen archaeological sites from the Palaeolithic to the industrial era, spread throughout Switzerland, have been highlighted. The internet platform [www.site-of-the-month.ch](http://www.site-of-the-month.ch) has been created to provide information on these archaeological sites and to share current information in four languages (French, German, Italian and English). In parallel, a “Site of the Month” Facebook page as well as Twitter and Instagram accounts have been created to provide real-time information on the activities related to these archaeological and historical sites. At the end of the program, these online windows were maintained in order to carry on the communication on archaeology. In 2018, a study on the scope of these different networks was carried out to measure the subscribers’ reactions (likes, shares and comments). The objective was to have a better understanding of these outreach strategies. In this paper, we will detail how the different communication channels reach the public and how the audiences react to them.

**3 OPEN HERITAGE FOR ALL OVER THE WORLD? LET’S GO ON!**

**Abstract author(s):** Peter, Sigrid (ArchaeoPublica)

**Abstract format:** Oral

Is it possible to spread the idea of heritage and archaeology all over the world? Maybe by including the public in preserving monuments and fighting for archaeology. Is science able to reach more people and are we able to share actual news and archaeological discoveries in an easy way? Maybe that needs some work, but with new technologies combined with social media it will be possible!

Here is a concept idea for an online-platform to empower non-academics to be part of archaeology and heritage: In recent years, hundreds of thousands of online courses have popped up and changed our lives. Some of them are just for fun, others for learning new languages, and others for professional training. The idea presented in this concept paper is to create a well-designed online course for citizens who are interested in archaeology and heritage. The course will have modules which can be completed to get theoretical skills that could then be used in practice. Some advantages of this approach are, for example, better scientific communication and mediation, giving citizens an idea of archaeology before they go to university or having the opportunity to present archaeology and heritage and new discoveries on a multimedia level.

The basic idea is to build an online course which has different modules and ways for further training. There should be an introduction and different approaches from which the user can choose the approach that best suits their needs. In the best case scenario, non-academics will be able to get an officially approved certificate which allows them to do some types of archaeological work with or without professionals and in cooperation with the Federal Monument Offices. This course could be combined with the “Archaeological Skills Passport” which is used in the UK, Austria and Germany.

4

**ONLAAH: ONLINE LEARNING ON AFRICAN ARCHAEOLOGY & HERITAGE. ENGAGING A NEW GENERATION OF RESEARCHERS AND THE PUBLIC INTO AFRICAN ARCHAEOLOGY**

**Abstract author(s):** Fonseca, Sofia (Teiduma, Consultancy on Heritage and Culture; ICArEHB, Algarve University; German Archaeological Institute) - Linstädter, Jörg Linstädter (German Archaeological Institute) - Cascalheira, João (ICArEHB, Algarve University) - Bicho, Nuno (ICArEHB) - Honegger, Matthieu (Université de Neuchâtel) - Haws, Jonathan (University of Louisville)

**Abstract format:** Oral

There are thousands of courses on the internet, about almost anything, but there is no specific course in African Archaeology or heritage. In November 2016 a meeting was held on the Algarve University, in Faro, Portugal to create a consortium between four institutions: the German Archaeological Institute (DAI), the ICArEHB from the Algarve University, Portugal, the University of Neuchâtel, Switzerland, and the University of Louisville, United States of America. Since then, other institutions have embraced the project and became partners: the Eduardo Mondlane University, in Mozambique, the Autonomia of Barcelona University, in Spain, and very soon the University of Namibia.

Together the consortium is building the ONLAAH platform, an online platform on African Archaeology and Heritage (www.onlaah.com), to offer the first online course on African Archaeology and Heritage that will be accessible worldwide. The project brings together the experts (teachers, researchers) and the resources (online archives, publications, databases) into a platform that will provide knowledge and education in an organized way. The platform will also connect our community of students, teachers and researchers, with courses, resources and knowledge dissemination.

Our main goal is to create and engage a new generation of experts on African Archaeology and Heritage wherever they are, with no nationality, gender or wealth limitations, by offering the possibility of studying and learning how to preserve African heritage to future generations. In our presentation, we will introduce our project and online platform and discuss our challenges and vision for the future.

5

**LIKE AND SUBSCRIBE: DIG IT WITH RAVEN AND THE DEMOCRATIZATION OF ARCHAEOLOGICAL EDUCATION THROUGH YOUTUBE AND SOCIAL MEDIA**

**Abstract author(s):** Todd DaSilva, Raven (Dig it With Raven)

**Abstract format:** Oral

YouTube is now both the second largest website and second largest search engine in the world, with over 1 billion hours of content watched daily by over 2 billion users. Given this information, the creation of archaeological video and social media content is vital to remain relevant and accessible in today's educational climate. Social media content further democratizes archaeological education and puts a real face and name to the subject. This in turn facilitates the creation of a community and opens communication with the public.

Dig it With Raven is an online initiative that was founded in order to create educational and captivating archaeological videos that are thoroughly researched and accurate in order to serve archaeologists and students, while delivered in a manner and style that also engages the general public. Content is created and shared on various social media platforms such as YouTube and Instagram. The channel has become a popular source for public outreach and science communication within archaeology and cultural heritage. It also serves as a platform to dispel misinformation and misinterpretation. Through social networks and YouTube, Dig it With Raven and other channels such as Ethnocyology, Amelia Archaeologist, and ArchaeologyInk have brought archaeological education to the public through an accessible, engaging medium that is changing the way the public views and interacts with archaeologists.

The creation and success of these channels and accounts demonstrate that social networks can and should be used as a tool to present real world archaeology to the public, as well as a cutting edge method to educate and inspire the archaeologists of the future.

6

**FROM ANCIENT CORINTH TO EVERY CORNER OF THE WORLD: SKYPE IN THE CLASSROOM AND THE ROLE OF ONLINE EDUCATION**

**Abstract author(s):** Gizas, Eleni - Papadakis, Manolis (American School of Classical Studies at Athens - Corinth Excavations)

**Abstract format:** Oral

Over the last decade, Web 2.0 and internet technologies have attracted a large number of professionals and academics from the heritage sector as an advanced tool for sharing cultural content. An increasing number of archaeological organizations has been encouraged to make use of these technologies to disseminate archaeological material, thereby utilizing digital public archaeology as a popular practice to share knowledge and interact with worldwide audiences. In 2017, the American School of Classical Studies at Athens - Corinth Excavations launched the "Virtual Field Trips" program through Skype in the Classroom, a free online community created by Microsoft Education. In its third year of using Skype in the Classroom, the American School has conducted over 300 virtual field trips for over 9,700 students in 37 countries around the world. These Skype lessons are just one type of outreach program that, together with on-site programs and free lesson plans, aim to bridge the gap between scholarly research and classroom teaching. They are intended to supplement existing curricula on Greek or Roman art and archaeology by providing students with a "behind the scenes" look at the site of Ancient Corinth, our active archaeological excavation, museum artifacts, and the conservation lab. Since students typically have some pre-existing knowledge of ancient Greece or Rome, the live Skype sessions present archaeology as

a tangible discipline whose ongoing process of inquiry continuously contributes to our understanding of the ancient world, even today. In this presentation we discuss course design and content as well as evaluation results, benefits, and further opportunities for public outreach and engagement that may be offered through this platform. We investigate the challenges of promoting localized content in a global setting, of making this information relevant to students around the world, and of making a lasting impact during a relatively short Skype call.

7

**A CROSS-DISCIPLINARY APPROACH TO DISSEMINATE ARCHAEOLOGY ONLINE**

**Abstract author(s):** Toulouse, Catherine - Lengyel, Dominik (BTU Cottbus-Senftenberg)

**Abstract format:** Oral

Archaeology has a lot in common with architecture. Both disciplines deal with the unknown and the uncertain. Archaeology, in its pursuit for knowledge always remains open to a certain degree. So does architecture with its inherent design strategy that concretizes ideas and proposals step by step. Both disciplines argue with abstraction--archaeology with an emphasis on verbal and architecture with an emphasis on visual expression. Still, architecture is intensively trained in public communication. All means of architectural representation methods are designed to meet the public's needs, that is clients and authorities. Our approach is to translate methods of architectural design and visualization into the needs of archaeological dissemination and sustainability. As both disciplines evolve in the digital world, an online approach to their content is more than obvious. Especially the growing availability and acceptance of VR experiences allow a spatial impression that is equaled only by on-site visits accompanied by an intense guidance with the strong ability of vivid imagination. VR experience can raise knowledge, awareness, responsibility and inspiration for heritage education, research and design work respectively.

This presentation aims to demonstrate and illustrate this method through several projects developed by the authors in cooperation with archaeological research institutions: Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral), Bern Minster – its first century (by order of and published by Bern Minster Foundation), The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOL, exhibited as part of Sharing Heritage, the European Cultural Heritage Year 2018), the Palatine Palaces in Rome (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin), the Ideal Church of Julius Echter (by order of the Martin von Wagner Museum in the Würzburg Residenz combining physical models, auto-stereoscopy and VR experience).

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**DOING OUR BEST, FINDING COMMON GROUND: ARCHAEOLOGICAL STANDARDS THAT TRANSCEND NATIONAL PRACTICE [PAA]**

**Theme:** 7. 25 years after: The changing world and EAA's impact since the 1995 EAA Annual Meeting in Santiago

**Organisers:** Hinton, Peter (Chartered Institute for Archaeologists) - Hessing, Wilfried (Vestigia) - Wait, Gerry (EAA Committee on Professional Associations in Archaeology; GWHeritage)

**Format:** Regular session

This session is organised by the EAA Committee on Professional Associations in Archaeology and the Chartered Institute of Archaeologists (CifA).

Many areas of archaeological endeavour have developed standards for undertaking fieldwork and laboratory-based work. Standards also exist for the conservation of sites, monuments and landscapes; for the curation of collections of artefacts and records; and for the delivery of projects. Many – but not all – of these standards are based on approaches in particular countries, and have evolved to meet national needs of the administrations and culture. There are also international standards: some have been formalised through ISO, others have been produced by standards-setting organisations like CifA. There are also transnational standards of employment and environmental protection eg those governed by EU directives, affecting both member states and third-party states.

This session seeks to explore the variety of standards that apply to archaeology, and to find common ground between different approaches – whether they are national or disciplinary. As archaeologists our aim must be to undertake the highest quality of work for public benefit.

We are calling for papers that answer the questions

- Are the standards we use as good as they could be?
- Do they best serve archaeology, the public, or archaeological institutions?
- Do they serve to challenge or to reinforce power relations?
- How might we find common ground to improve the practice of archaeology?

We do not want papers that describe national legislation or the detail of particular organisations' approaches to quality management, as these topics have been discussed frequently at EAA meetings. But we are seeking contributions that discuss examples of approaches – or entirely new ideas – that will help European archaeologists identify potential common solutions. We invite researchers in all fields and from all nations to join the discussion!



1 TRANSCENDENTAL ETHICS: ARCHAEOLOGISTS VALUES, ETHICAL PRACTICE AND STANDARDS

**Abstract author(s):** Wait, Gerald (GWHeritage OU)

**Abstract format:** Oral

How effective are we as archaeologists? This is a timely question because there are more of us, doing more archaeology than ever before. Standards for DOING archaeology have been created and implemented in many places at various times, usually with the goal of trying to ensure that archaeological work is of better quality and delivers more and better outputs. Others in this session will speak to the international applicability, effectiveness and characteristics of such standards. This paper starts with a different perspective and notes that standards are in many – important – ways based on the ethics of archaeological practice and that ethical codes are in many ways far more transcendental than the details of how we do what we do. Moreover, ethics are in turn based on our values – so to the extent that human values are in any meaningful sense universal, so too should be our ethics of practice, thus setting the stage for creating basal standards for the details of archaeological practice.

2 THE STANDARDS OF ITALIAN PUBLIC ARCHEOLOGY BETWEEN REGULATIONS, HYPERSPECIALISM AND FUTURE PROFESSION

**Abstract author(s):** La Serra, Cristiana - Giorgio, Marcella - Cerbone, Oriana - Garrisi, Alessandro (ANA)

**Abstract format:** Oral

In an increasingly connected international scientific community, it becomes a priority to find common ground and shared practical applications for the management and dissemination of scientific data on cultural heritage. Shared and transnational standards can be a valid instrument of protection, knowledge and future planning involving the public, archaeological institutions and professionals of each country. The standards used in Italy, edited by ICCD, are valid, but have a vulnerability: up to now they are mainly used by the State for the State itself, in the field of cataloging of archaeological heritage; and the training for the application and implementation of these standards is allowed only to MiBACT staff, in rare cases to few researchers. This means that this knowledge is not known and applied by professionals who do not work at the Ministry. So from this point of view, Italy is in a disadvantage situation compared to the European countries. Therefore it is necessary to overcome this internal limit in our own country and obtain a more general application of the standards at all levels, not only in ministerial areas. And moreover, we have to update our standarians in a shared and transnational perspective, also according to the dictates of the Valletta and Faro conventions.

The future, however, must be declined on the basis of gis and open data so as to be useful to all possible categories of users, first of all professionals in the sector, but also the general public of users of the Heritage and the institutions that protect it.

3 SHOULD COMMUNITY ARCHAEOLOGY PRACTICE INFLUENCE PROFESSIONAL QUALITY SYSTEMS?

**Abstract author(s):** Van Londen, Heleen (University of Amsterdam) - Lewis, Carenza (Lincoln University) - Marciniak, Arkadiusz (Adam Mickiewicz University Poznań) - Vareka, Pavel (University of West Bohemia)

**Abstract format:** Oral

Across Europe, systems designed to uphold professional quality in archaeological practice are being constantly challenged and re-defined to meet changing conditions. In many countries, systems are designed for commercial practice and relate to field research processes (standards), professionals (a register) and organisations (permits). Some standards also cover community archaeology activities, for instance those of ClfA. The Faro Convention challenges the limitations of commercially defined standards - as is the case in for instance The Netherlands, Poland and the Czech Republic -, by advocating for heritage to advance a range of societal issues, including wellbeing and participatory practices. Community projects which are extending archaeological participation beyond professional practice offer opportunities to re-design and modify existing professional standards frameworks to accommodate the needs of an ever-diversifying field.

The EU-funded project “Community Archaeology in Rural Environments Meeting Societal Challenges” (CARE-MSoC) uses participatory test pit excavation – conducted as a form of sampling - in presently occupied villages based on a ‘citizen science’ model involving members of the public. Researchers from the Czech Republic, Poland, UK and the Netherlands are collaborating for a period of three years to coordinate the excavations and assess the outcomes, which will include a ‘best practice’ set of recommendations and toolkits. This will be developed within this international context, taking into account variations and commonalities in opportunities and impediments encountered: this paper discusses our preliminary draft. We would value input regarding (a) the feasibility of this and (b) the best format for standardised approaches and toolkits which can be used to deliver impactful and socially beneficial participative community archaeology in different countries and broaden the scope of existing professional quality systems.

4 DOING OUR BEST, FINDING COMMON GROUND: ARCHAEOLOGICAL STANDARDS THAT TRANSCEND NATIONAL PRACTICE IN IRELAND

**Abstract author(s):** Kyle, James - Sullivan, Eoin (Institute of Archaeologists of Ireland)

**Abstract format:** Oral

The Institute of Archaeologists of Ireland is the professional organisation which represents archaeologists on the island of Ireland.

The Institute is currently undertaking a review of its own standards and we are also looking at those of our peers in an attempt to produce a new set of standards in line with current archaeological best practice. We require standards that are forward thinking, but which also must apply to a landmass occupied by dual jurisdictions which are unified by their shared archaeology. This paper seeks to firstly discuss the historic and current approaches to standards in Ireland, whilst outlining why those approaches came about or what they were prompted by and if they might now be considered to be lacking with the benefit of hindsight.

Secondly the paper will discuss the current challenges and issues which are guiding the thinking surrounding our attempts to create a set of up-to-date and new standards for our profession.

The discussion of both of these strands will attempt to encompass and answer the questions of the session with reference to Ireland:

- Are the standards we use as good as they could be?
- Do they best serve archaeology, the public, or archaeological institutions?
- Do they serve to challenge or to reinforce power relations?
- How might we find common ground to improve the practice of archaeology?

5 SHARED PAST, SHARED ETHICS, BUT DIFFERENT STANDARDS: THE MECHANISMS BEHIND OUR NATIONAL STANDARDS AND WHY THEY MIGHT BE HARD TO OVERCOME

**Abstract author(s):** Helsing, Wilfried (Vestigia Archaeology & Cultural History Ltd.)

**Abstract format:** Oral

This paper will ask a lot of questions. In the last 20 years many European countries have developed a set (or sets) of standards to regulate archaeological work. In this paper I will first try to explore some of the reasons why. Are these standards and guidelines more or less the same in each country? Who made them? For whom or what purpose? Who controls or enforces them? Secondly I will ask questions like, do these standards (still) suit us as professionals, do we need standards more or less, and is there a real need for (international) common ground and if so, what makes it so hard to cross borders and put that into practise?

I will provide some provisional answers – I have done some research – but hopefully we can find more and better ones together. My own views might be slightly coloured by many years of working within the Dutch system, and trying to improve it, not only as an archaeologist, but also as a company director. For example, in my experience the Dutch standards have more to do with how to run a company than how to get better archaeological results.

Although there is professional common ground and there are even some international rules and regulations, national archaeological standards have diverged over the years, and have got the tendency of becoming unnecessarily wide-ranging and complicated. If we are serious about cross border archaeological research and cooperation between professionals in large-scale international infra-structural projects, we need to merge our standards in an international framework. What about the EAA?

6 CIFA STANDARDS: WHAT SHOULD WE BE DOING?

**Abstract author(s):** Hinton, Peter (Chartered Institute for Archaeologists)

**Abstract format:** Oral

This paper will present ClfA's proposals to reform its standards and guidance for easier international use. It envisages internationally applicable outcome standards, supported by internationally applicable high-level guidance on good practice approaches. A secondary level of guidance would be detailed national and local guidance or specifications on how the high-level guidance should be interpreted, and how the ClfA standard should be met. This could be produced, as different legal and cultural norms demand, by national or local authorities or by national professional groups. In the latter case, is there scope for a pan-European wiki effort? Some of this guidance already exists for some of the UK nations, but it needs updating.

The paper will look at the benefits of setting transnational standards. But it will also explore the challenges, and the more difficult hazards of transnational guidance. To get there, we need to step back to get a better view. What is a standard? How does it differ from guidance? Is a standard intended to produce excellent, or merely adequate, work? Is the session abstract right to say that our aim must be to undertake the highest quality of work? Is there such a thing as high quality? What is fitness for purpose? How do professional archaeologists' obligations to comply with standards relate to their civic duty or complying with the law? Oh, and what are we going to do when we finish talking?

7 STANDARDS AND GUIDANCE: IN PURSUIT OF QUALITY AND THE DELIVERY OF PUBLIC BENEFIT

**Abstract author(s):** Geary, Kate (Chartered Institute for Archaeologists)

**Abstract format:** Oral

The Chartered Institute for Archaeologists has been setting standards and providing guidance to its members since the early 1990's. The thirteen documents cover the main areas of archaeological work with the oldest Standards and guidance covering processes and products (excavation, field evaluation, building recording etc) and more recent examples also covering roles (the provision of archaeological advice, for example). The Standards and guidance exist to provide a measurable quality standard but may be used in a variety of ways: by national and local authorities to specify the outcomes required of archaeological work within the spatial planning system, by consultants as a basis for procuring the services of archaeologists on behalf of their clients, by the

archaeologists themselves in the design and delivery of archaeological projects.

This paper will outline some issues around the effectiveness of the Standards and guidance as a tool serving many purposes and will promote discussion on how we might move away from paying lip-service to published standards towards meaningful engagement in pursuit of quality and the delivery of public benefit.

318 **TOWARDS AN ARCHAEOLOGY OF PARTISAN AND RESISTANCE NETWORKS AND LANDSCAPES IN 20TH-CENTURY EUROPE**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Symonds, James (University of Amsterdam) - Vařeka, Pavel (University of West Bohemia)

**Format:** Regular session

Resistance to occupying forces and state repression took many forms in 20th-century Europe, ranging from covert networks that served to conceal or assist the escape of vulnerable individuals or families, to guerrilla warfare. This wide spectrum of activities included not only armed opposition but also many forms of passive resistance. Acts of resistance were undertaken by men, women, and children. But as Sarah De Nardi has noted, these actions were often ‘transient, placeless, and invisible.’ (De Nardi 2017). How, then, may we best recover archaeological traces of such underground networks, and the courageous yet fleeting moments of defiance and dissent which they supported? We invite contributors to explore the tangible and intangible heritage of resistance movements and operations across 20th-century Europe. We welcome archaeological perspectives on the following themes:

- How can historical sources be combined with archaeological evidence to understand the lived experience of resistance activities?
- How have recent advances in archaeological remote sensing and the systematic use of metal detecting refined understandings of how resistance personnel negotiated landscapes and created hidden camps, bunkers, and other features in forested areas?
- How have multi-scalar approaches to conflict archaeology changed the study of partisan or resistance networks?
- Can traces of resistance operations be found in urban settings?
- Material remains of mass repression of real or suspected civilian supporters of partisans (e.g., destroyed villages)
- How can archaeological traces of resistance activities be managed and presented in contemporary landscapes and museums?
- How has the contested heritage of former resistance sites divided contemporary societies?

De Nardi, S. (2017). The invisible materialities of the Italian resistance movement during World War 2. Building Bridges: Abstract Book of The 23rd Annual Meeting Of The European Association Of Archaeologists, Maastricht, Netherlands, 105-105. Retrieved from <http://www.eaa2017maastricht.nl/download2476>.

**ABSTRACTS**

1 **LIVING IN THE CITY OF THE FOREST: THE ARCHAEOLOGY OF LIFESTYLES OF THE NORTHWESTERN IBERIA GUERRILLA MOVEMENT**

**Abstract author(s):** Tejerizo, Carlos (Universidad del País Vasco) - Rodríguez, Alejandro (Universidade de Santiago de Compostela) - Romero, Antonio (Universidad del País Vasco)

**Abstract format:** Oral

Officially, the Spanish Civil War ended on April, 1st 1939. However, war dynamics continued through time, articulated around the struggle between the new Francoist state and the guerrilla movement. One of the most relevant fronts was formed in northwestern Iberia, around, a cluster of guerrilla sites located in the mountains of Casaio (Ourense, Galicia) known as the “Ciudad de la Selva” (city of the forest), occupied between 1940 and 1946. Even though there are some written sources and oral records which deal with these sites, only through archaeological excavation and the resulting material evidence have we delve into the complexities of the guerrilla warfare and the quotidian life of those guerrilleros who lived in the camps. After three years of archaeological work, which included survey fieldwork, archaeological excavations and oral interviews, we have unearthed a very significant set of material culture which directly delves into the quotidian life of the guerrilla movement. This includes topics such as diet, illnesses, gender roles and relationship, or the ways they fought against boredom. In this paper we will present the main results of this project and also the impact it had in the current local community.

2 **DREŽNICA: AN ARCHAEOLOGY OF RESISTANCE IN WW2 YUGOSLAVIA**

**Abstract author(s):** Gomes Coelho, Rui (UNIARQ-Center for Archaeology, University of Lisbon) - Ayán Vila, Xurxo (Institute of Contemporary History, New University of Lisbon) - Horvatinčić, Sanja (Institute of Art History, Zagreb)

**Abstract format:** Oral

In April 1941, Nazi Germany invaded the kingdom of Yugoslavia. Axis forces and their Croatian collaborators were opposed by organized resistance. The Communist Party of Yugoslavia led the resistance movement and organized a vast network of military facilities,

shelters and refugee camps that was developed between 1941-1945. Many sites of significance for the resistance were repeatedly destroyed by the Axis and publicly memorialized after 1945, such as in the case of Drežnica, a village in central Croatia. In this paper, we will present and discuss the project “Heritage from Below. Drežnica: Traces and Memories 1941-1945”. This interdisciplinary project aims at locating and documenting partisan sites, monuments and memorial areas of the wider Drežnica area in order to understand guerrilla warfare strategies and the complex program of memorialization in post-war Yugoslavia. Our community-based approach consists of archival research and fieldwork, which includes ethnography, photographic documentation, topography, geodetics, architectural surveys, as well as archaeological work. The research project is being carried out in collaboration with the community of Drežnica, which participates in every step of the project, including research design and dissemination plans. In the Fall of 2019, we conducted the first archaeological field season of the project. It included an extensive survey of the Drežnica region based on historical cartography and oral history. Based on this survey, we will analyze the patterns of distribution of the camps and shelters in the region and compare them with the post-war memorialization plans.

3 **CAMP SITES, PILLBOXES AND DUGOUTS AS HIDING PLACES FOR “FOREST GUARD” – FINNISH DESERTERS AND RESISTANCE MOVEMENTS OF CONTINUATION WAR 1941-1944**

**Abstract author(s):** Kauhanen, Riku (University of Turku, Department of Archaeology)

**Abstract format:** Oral

During the Finnish Continuation War against Soviet Union in 1941–1944 thousands of Finns refused to go to war, some because of earlier traumas from Winter War in 1939–1940, and some because of their pacifist or communist beliefs. The latter formed a small resistance fighting force inside Finland, with small concentrations around major cities and some other areas, committing sabotage and espionage for the Soviet Union. These resistance fighters had to move into forests and other hiding places “under ground” in order to avoid getting caught. Some stayed in cities, where elaborate secret rooms were constructed to hide and to print propaganda leaflets.

In my archaeological PhD I study these hiding places by combining the use of archaeology and folklore, namely oral history and oral memories. Also, thorough archival research is used to find these places and understand their history. Many places still have great meaning for local people and the memories of the places have been passed on to the next generations. It is almost impossible to locate and recognize these places without local help. Many of these places, such as shallow dugouts, have mostly been disappeared in recent years because of natural decay. The aim of this study is to locate these places, gather the historical knowledge of these places from local informants and archives, and to provide encompassing image of these sites, which vary in size, structure, time of use and the status and motivation of dwellers.

In my presentation I will explain the phenomena of Forest Guard, give some examples of places and their folklore and history and how to study such subjects. I will also discuss the importance and urgency of studying these places, which have deteriorated rapidly in last few decades.

4 **BATTLEFIELDS OF THE LITHUANIAN PARTISAN WAR: A COMPLEX APPROACH**

**Abstract author(s):** Petrauskas, Gediminas (National Museum of Lithuania; Klaipėda University, Institute of Baltic Region History and Archaeology)

**Abstract format:** Oral

Battlefield archaeology as a subdiscipline of archaeology formed in the United States in the mid-1980s. Since then, the methodology of battlefield research has been developed and numerous opportunities for comparing archaeological and historical data, narratives of the witnesses, and cartography have been revealed. Today, battlefield archaeology covers all historical periods. By focusing on the landscape, detailed reconstruction of past conflicts, war tactics, experimental and heritage studies, and application of GIS analysis, battlefield archaeology has expanded the possibilities in researching modern military conflicts.

The battlefields of the Lithuanian Partisan War (1944-1953) became the subject of archaeological research in the early 2010s. The investigations of Lithuanian Partisan War battlefields, like any research of modern conflict sites, are essentially interdisciplinary. Comprehensive archaeological fieldwork allowed the researchers to determine the positions of Lithuanian partisans and Soviet soldiers, restore the battle scene and its course, the routes of attack and retreat, and trace directions of firing. Moreover, it provided valuable data on the weapons used in the battle, the uniforms and clothing of the partisans, and also the battles themselves. The paper presents four case studies of the recently investigated Lithuanian Partisan War battle sites, giving their analysis and interpretation. By revealing the significance and possibilities of complex research, the author discusses the concept of the archaeology of the Lithuanian Partisan War battlefields.

5 **ARCHAEOLOGY OF THE “MISTR JAN HUS” PARTISAN BRIGADE IN THE OCCUPIED CZECHOSLOVAKIA (1944-1945)**

**Abstract author(s):** Vareka, Pavel (University of West Bohemia) - Symonds, James (Amsterdam University)

**Abstract format:** Oral

In the autumn of 1944 the Soviet Union intensified the supply of airborne partisan groups to so called “Protectorate Bohemia and Moravia”, the occupied territory of Czechoslovakia. The Mistr Jan Hus partisan brigade, named after the famous Czech religious

reformer of the early 15th century, founder of the Hussite movement, started operating in eastern Bohemia in October 1944 and was active until the end of the war in May 1945. The 12-member group of specially trained Red Army soldiers soon expanded to include escaped Soviet POW and Czech forced labourers and was divided into several units operating in different parts of the Bohemian-Moravian Highlands. Partisans were greatly supported by local people, mainly by providing food, shelter and information. The task of partisan units was not only to carry out diverse and sabotage operations but also to perform political activities, especially by establishing underground municipal “national committees”, which were supposed to be involved in armed resistance and to take over the administration after liberation. The Soviet Union also regarded these partisan groups as an important means to ensure the decisive political role of Communists in post-war Czechoslovakia.

The typical material evidence of partisan activities in East Bohemia, but also in other parts of the country, are so called “bunkers” (sunken shelters) which create an important, tangible component of the local historical memories linked to the WWII. In the post-war period, memorials were established in the places of known partisan bases and the Communist regime used these sites for commemorating and celebrating the Soviet-led anti-Nazi resistance. Archaeological research examined, for the first time, the material remains of partisan bases using archaeological techniques, documenting the formal attributes of partisan “bunkers” and possible uses and also investigating the landscape context of these features and topography in comparison with documentary evidence and oral testimonies.

6

## PERSONAL FREEDOM IN THE TOTALITARIANISM OF THE 20TH CENTURY IN THE PRISM OF PHYSICAL ANTHROPOLOGY AND ARCHAEOLOGY

**Abstract author(s):** Konczewski, Pawel (Wroclaw University of Environmental and Life Sciences, Department of Anthropology) - Orlicki, Łukasz (Independent researcher) - Król, Katarzyna - Martewicz, Katarzyna - Szczurowski, Jacek - Kwiatkowska, Barbara (Wroclaw University of Environmental and Life Sciences, Department of Anthropology)

**Abstract format:** Oral

The dynamically developing physical anthropology and archaeology of modern conflicts and cases of violation of Human Rights until recently was largely focused on solving strictly technical problems. The focus was, among others, on developing interdisciplinary methods for analyzing mass graves. The scientific activities have been focused on recognizing evidence of institutional and mass oppression against citizens of totalitarian countries, for example, the infrastructure of concentration camps. Physical anthropology and archaeology have also gained new social functions, such as humanistic to restore the identity of mortal victims of totalitarian systems. These scientific fields are also used in collecting court evidence of crimes against humanity.

Victims are shown as a subject of history. With this in mind, we ask questions: to what extent oppressed individuals managed to maintain their freedom, what were the consequences of it? We will present examples of preserving areas of freedom manifested in civil and armed resistance to Nazi Germany, Soviet Russia, and communist government in Poland in 1945-1949:

- murder-suicide of a Germann Gleesner family,
- suicide Ukrainian Petro Wirstiuk, a courier of Ukrainian Nationalist Organization,
- massacre of Polish partisans of the National Armed Forces from the troops of captain “Bartek”,
- hiding the weapons of Polish partisans from the Home Army battalion “Giewont”.

Examples will help you to consider, whether and to what extent, through anthropological and archeological research we can learn the intentions and nuances of the choices made by people involved in totalitarianism. Next, we will elaborate discussions about crimes against humanity and consider the role of scientists involved in their discovery.

7

## THE ARCHAEOLOGY OF CHARTER 77

**Abstract author(s):** Varekova, Zdenka (University West Bohemia)

**Abstract format:** Oral

Charta 77, named after the document from January 1977, was one of the most important civic initiatives in the Eastern Block. The main objective of this “loose, informal, and open association of people ...” (Text of the declaration of Charter 77) was to draw attention to human rights violations in Czechoslovakia and throughout the world. Despite the fact, that human rights were embedded in the Constitution and Czechoslovakia signed several international documents, as e. g. the Final Act of the 1975 Conference on Security and Cooperation in Europe (Helsinki Accords), the communist regime never intended to respect human and civil rights. After publication of Charta 77 communist authorities started an extensive campaign against signatories of this document, who were described as renegades and imperialist agents which was followed by harsh repressions against activists.

Recent research focused on topography of Charta 77 activities and their material testimonies regarding different private and public spaces both in urban environment and in the countryside. Tangible evidence of state repressions was also assessed which in some cases resulted in demolition of buildings used for dissident activities. These places can be studied as archaeological sites using both non-invasive techniques and trial excavations. Results of this project contribute to development of emerging “archaeology of communism”.

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## EAA COMMUNITY ‘CLIMATE CHANGE AND HERITAGE’ (CCH) ROUNDTABLE

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Biehl, Peter F (University at Buffalo, SUNY) - Dalen, Elin - Vandrup Martens, Vibeke (Norwegian Institute for Cultural Heritage Research - NIKU)

**Format:** Round table

We take it as a given that archaeology and the archaeological and cultural heritage of which it is part have much to offer efforts to address climate change: from palaeoclimatic data to models of adaptation and the roots of the modern global system within which modern climate change has developed. Evidence to date is showing that climate change presents an array of challenges for archaeology – from loss from erosion, fires, sea level rise, to disconnection due to migration and loss of contact of affiliated communities, and damage deriving from conflict and other social changes. If we understand climate change as a whole-of-society problem, then the fields of archaeology and heritage alone cannot realize its potentials for climate change or solve its challenges.

This fourth roundtable organized by the EAA Community Climate Change and Heritage (CCH) builds on the success of the Bern roundtable and hopes to extends two main issues discussed in Bern: (1) Prioritization and (2) Popularization.

We will also invite representatives of key archaeology associations such as the AIA, SAA and WAC as well as specialists in climate change and heritage research as a sounding board for the CCH activities as well as opinion leaders in methods and practice of climate change and heritage research. In addition, it will provide an update on the work done in and by the community since the Bern meeting, and discuss next steps for the Community to grow and extends its network and activities.

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## POST-MEDIEVAL PEOPLE AND THINGS: EXPLORING NETWORKS OF AGENCY

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Escribano-Ruiz, Sergio (University of the Basque Country - UPV/EHU) - Mytum, Harold (University of Liverpool)

**Format:** Regular session

Recent theoretical discussions have considered the agency of things, with a variety of reactions to this proposal. This session, supported by the Society for Post-medieval Archaeology, facilitates exchange of theoretical and methodological insights in the relationship of people with things, including documents as well as other artefact categories. Papers may examine the interconnections between materials, people and environment in the production of material culture, the ways in which the built environment and the constructed landscape affected human experience and action as well as being affected by human agency, and the relationships between portable material culture and social practices. The post-medieval period allows the use of documentary sources to contextualise human actors and understand elements of wider socio-economic and ideological structures within which the materials remains were created, acted and were acted upon, and were finally deposited. Much of the evidence from the recent past is also used in contemporary networks of politics, tourism and community and national identity, the material remains having a role in contemporary decision-making. The session will explore networks of agency over many different scales, and with a variety of theoretical perspectives regarding the application of network theories.

## ABSTRACTS

1

### GLASS BECOMES COMMODITY: MIGRANT WORKERS IN 17TH AND 18TH CENTURY ESTONIA

**Abstract author(s):** Reppo, Monika (University of Tartu)

**Abstract format:** Oral

The production of glass in Estonia started in the 17th century and brought about a lot of change. Not only did a local source of tableware, technical glassware and flat glass influence the use of glass in Estonia in general, it also resulted in demographic changes. Namely, the skilled workers at glasshouses were foreigners until the early 19th century. The locals were serfs at the time and with some minor exceptions were not allowed to hold skilled professions at the glass factories. This means the rapidly increasing use of locally produced glass in utilitarian contexts was directly influenced by an industry relying on migrant workers. The founding of a local industry is evidenced in the material culture by a significant increase in the use of forest glass vessels and windows. The styles and techniques employed both mirrored those in use in Europe but were also affected by local demands. This presentation examines the role of the glassworkers in the production and consumption of glass in 17th and 18th century Estonia through historical and archaeological sources.

2

### FINDS OF LATE MEDIEVAL AND EARLY POST-MEDIEVAL CLOTH SEALS IN SERBIA

**Abstract author(s):** Ramadanski, Rasko (Town Museum Becej)

**Abstract format:** Oral

Cloth seals were a widely underestimated category of archaeological material in Serbia, observed mostly as rare but vague examples of secondary historic sources. Namely, such an opinion on cloth seals can apply to the rest of Southeastern Europe as well. However, cloth seals can harbor valuable information regarding the extent of the textile market, trade routes and topography, the economic



standing of communities and can also greatly benefit if not decide the chronology of layers and other units on archaeological sites. In that regard, we hope to adequately describe the finds of late medieval and post-medieval cloth seals in Serbia. This includes material that was published in Serbian or foreign literature and, in greater quantity, the unpublished finds that were unknown to scholarly circles until this occasion. Furthermore, this presentation includes a review of earlier interpretations, including inaccurate attributions, and an introduction into applying a common methodology for studying cloth seals. A particular reference to concurrent regional finds must be made in order to establish a broader sense of cloth seal application and distribution.

3 MATERIALIZING INEQUALITY. POTTERY CONSUMPTION AND PRODUCTION IN THE BASQUE COUNTRY DURING LATE AND POST MEDIEVAL AGES

**Abstract author(s):** Escribano-Ruiz, Sergio (University of the Basque Country - UPV/EHU)

**Abstract format:** Oral

Pottery consumption and production patterns changed markedly between the 14th and the 17th centuries in the Basque Country. One of the significant aspects of this change was the progressive growth in glazed pottery consumption, as far as it became a common good in the course of these centuries. In this presentation, I aim to characterize the development of this process over time, try to delve into the process of technological normalization and demonstrate the active role of pottery in the social construction of inequality. In doing so, we will argue that non-verbal discourse of objects is as important now as was in Late Middle and in Early Modern Ages. We assert that the dialectical process happening among the pottery's agency and the adaptation of the productive structure to the new pottery types is what defined the changing nature of the pottery record in the area and period under study.

4 TOBACCO PIPES IN THE BRITISH ATLANTIC WORLD

**Abstract author(s):** Janzekovic, Izidor (Central European University)

**Abstract format:** Oral

Tobacco pipes have been described as the ideal archaeological artefact because everyone smoked, from young to old, from male to female, from poor to rich. Tobacco pipes were extremely fragile with practically no recycling value, so they had a relatively short life-span. The forms of the bowls and signs changed quickly and are therefore easily and relatively precisely datable, usually to 20-30 years precisely. The famous economic historians Jan de Vries and Ad van der Woude considered them to be 'a cheap, simple article of mass consumption. The clay pipe was the quintessential throwaway product – the Bic lighter of the 17th and 18th century' (Vries, Woude 1997, 309). The manufacture and trade of tobacco pipes created several professional and personal networks ranging across the ocean.

The paper presents one of the most widespread artefacts on the early modern archaeological sites, the tobacco pipes and their fragments. Ever since the discovery of America and the introduction of tobacco in Europe people have smoked tobacco with tobacco pipes. The short history of smoking and tobacco pipes is presented on the basis of material and written sources. The manufacturing process is key to understand the taphonomy of tobacco pipes. The rich tradition of tobacco pipes research in Great Britain and North America has introduced several theoretical and methodological novelties. Tobacco pipes can hold a lot of information on its users and the society at large as is shown with the example of Cotton pipes from Jamestown.

5 INTERREGIONAL NETWORK OF CONNECTIONS. WHAT IS THE SIGNIFICANCE OF THE PIPES FOUND AT FORMER KNACKER'S YARDS IN SILESIA, POLAND?

**Abstract author(s):** Duma, Pawel (Institute of Archaeology University of Wrocław)

**Abstract format:** Oral

The colonisation of the New World and the discovery of tobacco by Europeans developed a network of interconnectedness and dependence on a large scale over the following centuries. While the importance of this plant in economic history is often overestimated, indeed the demand for tobacco in Europe contributed to the development of numerous plantations in North America, but also resulted in the production of clay pipes on the old continent. During archaeological works, the pipes are mainly material remains of this custom, and their relatively precise identification provides us with the opportunity to trace the network of connections on a local and supra-regional scale. The purpose of this presentation is to discuss the analysis of the assemblage of pipes found in five execution sites also serving as knacker's yards that were studied in Silesia. The analysis of the collection partly confirms the monopolisation of the local market by pipe producers from Gouda, but also the attempt to break this monopoly by Prussia in the mid-18th century. At the same time, the results of the analysis make it necessary to verify the generally accepted view in the literature based on written sources, which speaks of a strong taboo, meaning that these places were avoided in the past and were not intensively used. It would appear that the material culture analysed was associated with a small group of people from a low social standing - mainly executioners' assistants. The nature of the surveyed sites provides an unusual opportunity to trace local networks and embed them in the global exchange of goods in connection with a narrow group of users. The author will present one of the possibilities of reading the information contained in the analysed set, its relationship with historical documents and analyses of other materials obtained at the sites.

6 EXPLORING THE AGENCY OF A BURIAL GROUND MEMORIAL

**Abstract author(s):** Mytum, Harold (University of Liverpool)

**Abstract format:** Oral

Monuments erected in graveyards and cemeteries provide a great deal of information about the deceased who are being commemorated, and about the stylistic, cultural, and aesthetic milieu in which they were created. Some memorials also inform us about the erector of the monument and that of the maker. Memorials therefore provide much information about human agency, and also aspects of structural agency including technology, ideology and economy. Less considered to date, however, has been the agency of memorials themselves, and this paper considers some of the ways in which monuments can be seen to have agency within the burial ground where they were erected. Monuments stand visible not only to the immediate mourning family and friends of the deceased, but also to the wider society visiting the burial ground. Moreover, the memorial stands over time, a long-term landmark which, in Britain and Ireland whence the case studies are drawn, is until the memorial collapses. Burial ground monuments are excellent examples of material culture to explore agency as they remain intact in their original place of use, within a well-preserved landscape that reveals a fine-grained temporal depth. Over their biographies, memorials may have phases of greater or lesser agency, and some memorials appear to exert more influence than others.

7 STANISŁAW ANTONI SZCZUKA AND HIS SON – AN ATTEMPT OF THE RELICS IDENTIFICATION IN THE FOUNDER'S CRYPT (SZCZUCZYN – POLAND)

**Abstract author(s):** Grupa, Malgorzata - Kozłowski, Tomasz (Institute of Archaeology, Nicolaus Copernicus University in Toruń)

**Abstract format:** Oral

It is obvious that in archaeological studies, coffin identification is not equal to identification of its contents – i.e. bodies deposited in it. Exploration conducted in the crypts under the presbytery of the church of The Name of The Holy Virgin Mary in Szczuczyn enabled to conduct a wide range interpretation of the grave goods on mummified human remains, as well as an exact identification of some of the dead. The presumed remains of the church founder: Stanisław Antoni Szczuka and his son Marcin were carefully anthropologically examined unfortunately in situ, what due to the fact of partial body mummification, limited the examination substantially. Only morphological features of a skull and dentition were accessible for tests, sex and age of men the moment of death were established, which confirmed our assumptions. Close biological relationship of both individuals was observed examining detailed skulls building. Interpretation of archaeological and historical data, supported by anthropological tests conclusions make us suppose that our identification was proper, although in the beginning phase of the studies, Marcin Szczuka was not identified as a male. Brief grave clothes analyses identified initially his garment as a woman dress. Careful detailed analyses indicated it was a loose home worn male gown, close in pattern to modern dressing gown, and in 18th c. known in Poland as 'rubdeszan' (robe de chambre). The fact changed the direction of further search for male descendants of Stanisław.

8 FEEDING CAPITALISM? UPLAND PASTORALISM IN IRELAND AND SWEDEN, AD1350-1850

**Abstract author(s):** Costello, Eugene (Stockholm University)

**Abstract format:** Oral

During the medieval-to-modern transition, the growth of major European cities, industrial centres and overseas colonies saw increasing demands for food being placed on rural communities. However, in northern Europe at least, most traditional historical narratives tend to focus on well-documented lowlands facing the North Sea where intensive cattle fattening and cereal cultivation was common. The experiences of upland farmers in places like western Ireland and western/central Sweden have been largely neglected. As a result, scholars have underestimated the role of extensive pastoralism in feeding key aspects of capitalism in northern Europe, and overlooked a resource for understanding the long-term implications of commercial livestock rearing in 'marginal' environments. This talk will present initial results from interdisciplinary landscape-level research on upland pastoralism in northern Europe from c.1350 to 1850. In south-west Ireland, I will examine the adaptability of farmers as they were exposed to external demands for salted beef and butter and, in turn, ask what influence they had on the development of a major trans-Atlantic provisioning trade. I will compare this with the strategies of Boreal forest farmers in inland Scandinavia, and highlight their role in the growth of Sweden's industrial mining district (Bergslagen).

a. ARTISAN AGENCY AND ENDURANCE OF COMMON WARE PRODUCTION: BUILDING POST-MEDIEVAL ECONOMY AND IDENTITY THROUGH PEOPLE-POTTERY ENTANGLEMENT

**Abstract author(s):** Travé Allepuz, Esther (Universitat de Barcelona) - Vicens Tarré, Joan (Museu de la Terrissa de Quart)

**Abstract format:** Poster

Greyware cooking pottery is a common find at Medieval sites across northern Spain and the Mediterranean North Basin. These coarse, plain and reduced ceramics were particularly abundant in Catalonia, dominating pottery assemblages at medieval rural sites [1]. Although greyware production experienced a deep crisis at the dawn of Modern Age, it had a very persistent tradition with some potteries lasting until the late twentieth century. Those who did had to rethink the product and update its final features to new and changing markets during the post-medieval period [2].

The town of Quart (Catalonia, Spain) is one of these. Greyware production still active at this site became not only the first economic

activity for centuries but also a sign of identity that provided traditional artisans with a sense of belonging. Since the foundation of Potter’s Guild in 1572 May 7th, the history of artisan agency and pottery production in Quart can be explored through written and material sources.

Our contribution aims at introducing preliminary results of an ongoing research project studying the materiality of these artefacts and their transformation in the post-medieval period. An integrated historical and archaeological approach built upon archival, material and ethnographic evidence has contributed to the understanding of people-pottery entanglement. Our poster suggests the convenience of including methodological approaches such as material science, statistical vessel shape analyses and experimental archaeology to understand diachronically how communities build their identities and traditions.

[1] Travé, E. et al. 2016. To the vicinity and beyond! Production, distribution and trade of cooking greywares in Medieval Catalonia, Spain. Archaeological and Anthropological Sciences, 8/4, 763-778.

[2] Travé, E. & Vicens, J. 2018. Terrissa negra i canvi social: Pervivències i transformacions en l’ús de ceràmica de cocció reductora a Osona i les comarques gironines a partir de la recerca arqueològica i documental, Ausa, 181-182, 829-850.”

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**DISSEMINATING AND CURATING NON-VISIBLE ARCHAEOLOGICAL SITES AND SIGNIFICANT CULTURAL LANDSCAPES THROUGH INNOVATIVE AND SUSTAINABLE IDEAS**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Runge, Mads (Odense City Museums) - Toreld, Christina (Museum of Bohuslän) - Knudsen, Nicolai (Museums of Eastern Funen) - Lundø, Line (Odense City Museums)

**Format:** Regular session

On-site dissemination of archaeological results during excavation usually has very high public appeal. In contrast, exploiting the results and giving feedback to the public once the excavation is done presents a more challenging situation. Often the archaeological remains are either removed or practically non-visible due to modern urban structures or blurred by agrarian development, and no monuments remain to provide the framework for dissemination of the history of the site. Similarly, in the case of protected cultural landscapes, there can be a lack of physical landmarks or monuments to highlight its cultural context.

The session will focus on sustainable dissemination of non-visible archaeological sites and significant cultural landscapes by welcoming new ideas on how to meet this challenge. Submissions could focus on how to make the non-visible cultural heritage outside the museums visible by applying innovative communication approaches, collaborating with stakeholders, make outreach projects or facilitate local ownership to the cultural landscape and heritage.

We welcome papers that deals with the challenges of disseminating non-visible or lost archaeological sites, protected cultural landscapes, as well as historical events that no longer can be associated with visible or permanent monuments. We also welcome papers that deal with the above mentioned, while focusing on specific target groups i.e. children or young adults, and the singular didactic considerations therein.

**ABSTRACTS**

1

**SUSTAINABLE HERITAGE MANAGEMENT THROUGH LOCAL INVOLVEMENT**

**Abstract author(s):** Runge, Mads - Mogensen, Mette (Odense City Museums)

**Abstract format:** Oral

In Denmark over the last decades a growing number of developer payed archaeological excavations has been seen and with this an increase in data as well as new research results have been achieved. This situation has at the same time raised a demand in society to get access to this knowledge in a new and innovative way.

The research results of archaeology are best disseminated on site but the problem for Danish archaeology is that most of the pre-historic structures was made of impermanent material. In combination with a high degree of cultivation of land, not much is left to see after excavation has been undertaken.

As the future of archaeology depends on support and engagement of society, it is necessary to develop ways of dissemination and processes of involvement of local stakeholders, so that people do understand their local history and feel anchorage here in. Creating a balance between on the one hand what society brings to archaeology in terms of financial support, and on the other hand what archaeology gives back to society in monetary as well as mental value (e.g. shaping of pried and identity) is thus important. In achieving this balance, the sustainable heritage management is met.

The project From Central Space to Urban Place has dealt with some of these issues and with this as a starting point, the paper will touch upon innovative projects which over the recent years have created new possibilities to tell the story to the society on site. Also, examples will be given of partnerships with new target groups and users that support a positive development towards a higher degree of sustainability. The paper will finally set light on some of the challenges that such a work provides. All in all, the presentation will form a basis for the session.

2

**ARCHAEOLOGICAL HERITAGE PRESERVATION AND SALVATION STUDIES IN LARGE SCALE INFRASTRUCTURE CONSTRUCTION PROJECTS IN TURKEY**

**Abstract author(s):** Dag, Haydar Ugur - Aral, Melih - Sevmen, Kilichan (REGIO Cultural Heritage Consultancy)

**Abstract format:** Oral

In the last decade, many large scale infrastructure projects such as Tanap Natural Pipeline Project, North Marmara Highway Project, Ankara-Niğde Highway Project have been carried out in Turkey with the financial support of international lender institutions. In all of these investments, preservation of archaeological heritage is one of the performance criteria where the management and contractors of these projects have to comply. During the ESIA (Environmental Social Impact Assessment) studies of these projects many new archaeological sites have been identified and officially registered in the national inventory. These sites are still under protection of public authorities. These ESIA studies were conducted by REGIO Cultural Heritage Management Consultancy which is a private construction archaeology company in Turkey. After identification of these new sites, REGIO conducted further studies such as test pit excavations and geophysics surveys and for the places where construction is not avoided, salvage and reconstruction works have been performed. The presentation will cover the works and findings in those projects.

3

**MANAGING A BIRTH CERTIFICATE**

**Abstract author(s):** Ravn, Mads - Lindblom, Charlotta (Vejle Museums)

**Abstract format:** Oral

The Jelling Monuments have been on the UNESCO list of World Heritage sites since 1994. They are considered among the most significant monuments of Denmark since the mid. 19th century when the King, Frederik VII conducted excavations there. One main reason is that a rune stone mentions that Harald, king of the Danes in the mid. 10th century ‘won all Denmark and Norway and Christened the Danes’. Thus, it is considered the ‘Birth Certificate’ of the nation of Denmark and the origin of the current pedigree of the royal line. Furthermore, the figurative motive on the rune stone of Christ on a cross is considered the cradle of Christianity in Denmark.

25 years ago the monuments consisted of only two, huge burial mounds, two rune stones and a church situated between the burial mounds. Additional research excavations carried out between 2006 and 2013 with the National Museum and Aarhus University revealed under the top soil among others, a huge palisade, which encircled the area – three Viking houses of Trelleborg-type and possibly the largest ship setting seen in the Nordic countries from the Viking Age.

The new discoveries revolutionized the interpretation of the site. Also in 2018, it led to a minor boundary modification of the UNESCO site.

This paper will reveal 25 years of experience with managing this site and disseminating the knowledge from the visible and invisible remains in new ways seen from a perspective of a local museum. There have been different challenges, compromises and successes, meeting the needs of different stakeholders in a democratic society. In general, it is a success story. Therefore, the content of this managing plan will be presented and discussed.

4

**THE DISSEMINATION OF A MODERN CITY’S NON-VISIBLE HERITAGE**

**Abstract author(s):** Lundø, Line (Odense Bys Museer)

**Abstract format:** Oral

With focus on on-site dissemination and teaching aimed at children and young adults, this paper presents how the non-visible cultural heritage in cities can be disseminated through dramatizations, role-playing games and board games.

In today’s city of Odense in Denmark, the material culture of the past hides below modern-day roads, parking areas and buildings. The city has a continuous prehistory that dates back more than 1100 years. It contains a wealth of exiting local historical narratives and archaeological sites, that not only recounts the development of the city, but also shows how it has played a role in the formation of the kingdom and shaped the history of Denmark.

Without the visual and physical traces of the past, we have taken alternative steps to establish a framework for engaging, historical experiences. These measures familiarize the local population with the history of the city and connects them to their past.

To make the non-visible visible, we have created city walks and special events such as bringing the early-medieval city center to life in a Viking Horror Walk in collaboration with more than 100 re-enactors. Moreover, we have developed two sets of educational materials for school children. One of which is a board game that revolves around the Danish Viking Age ring fortresses. In a combination of strategy, knowledge, cooperation and role-play, it allows the pupils to reflect and immerse themselves in the social world of the Viking Age.

5

**BRINGING 150 YEARS OF ARCHAEOLOGICAL RESEARCH INTO THE CLASSROOM – AN IRON AGE MINECRAFT ADVENTURE AS A TOOL FOR EDUCATION**

**Abstract author(s):** Krappala, Kim (University of Turku, Department of Archaeology)

**Abstract format:** Oral

Minecraft is one of the most popular videogame platforms in the world and has been implemented globally for educational purposes.

es in a variety of contexts. In archaeological and cultural heritage education, however, Minecraft games are typically used solely for either building or observing past landscapes. However, in 2017, the Emil Cedercreutz Museum, near the west coast of Finland, provided the opportunity for a new, more engaging and interactive application of the Minecraft platform when they requested the development of a learning game for their prehistory exhibition. To answer this call, a multidisciplinary team, consisting of pedagogists, archaeologists, roleplaying specialists, voice-over actors, and a programmer, was formed. Together, they used the Minecraft platform to develop an adventure game set in a reconstructed landscape of the Kokemäki-river. The Kokemäki-river area is one of the most archaeologically rich iron age landscapes in Finland. While there have been numerous excavations there, little had previously been done to interpret Kokemäki-river’s prehistory in a visually reconstructive and interactive way. The resultant adventure-based learning game depicting the Iron Age history of the Kokemäki river area was well received by the museum and its visitors. Further, the game showed promise as a platform for bringing Iron Age pre-history to the classroom.

This presentation provides a first look at the implementation of the game into the classroom, directions for further game development, and the pros and cons of using Minecraft for prehistory education and as a learning game platform for sustainable cultural heritage education.

6 **PLAY YOUR WAY TO KNOWLEDGE OF THE PAST – A (EXCAVATED) 16TH-CENTURY CITY GOES DIGITAL**

**Abstract author(s):** Azzopardi, Amanda - Bakunic Fridén, Imelda (Rio Göteborg Natur och Kulturkooperativ)

**Abstract format:** Oral

Once upon a time, under today’s high buildings, the tram tracks and train station lay a city called Nya Lödöse. Today there are no visible traces of that city, but during its time it was a bustling city where people from all corners of today’s Europe met. They made deals with one another, enjoyed each other’s company and lived in a world where not only war was just around the corner but also new diseases and sudden political decisions that affected the common lives from one day to another. This city existed between 1473-1624 on the west coast of Sweden. During this time it had great importance but has since then been forgotten. Between 2012-2018, the city came to light once again during a large excavation. At that time, the locals were updated on what was going on via digital media such as Facebook, an excavation website, Youtube and Flickr, as well as through 12 published magazines and through on-site visits. The excavation is now finalized and yet again, the city has fallen into the shadows of memory.

As a final public outreach product, the city has been brought to life through a digital game, where the documentation from the excavation has been used to create Nya Lödöse and where the player cannot only play missions adapted after the historical information from that time but where the player can enjoy a walk in an early modern city in Sweden.

This paper will narrate the process and result of building a digital version of Nya Lödöse in the attempt of making a non-visible cultural heritage site available and sustainable for the future through a gaming product.

7 **CREATING ARCHAEOLOGICAL LANDSCAPES – FINDING NEW WAYS FOR MEDIATION AND PARTICIPATION IN CONTRACT ARCHAEOLOGY**

**Abstract author(s):** Nelson, Matthew (Linnaeus University)

**Abstract format:** Oral

Excavations are often unique opportunities to experience archaeological sites, a temporal window to the accumulated history of a place, open only for a very limited time. It could be argued that an excavation is an event and that the site is a stage where archaeologists conduct a performative act in real time. In many cases, however, the excavation site is restricted and treated as part of a development phase rather than a cultural event. The results and finds from the excavation are also often displayed to the public long after the site has perished.

By acknowledging and finding solutions for the challenges in mediation and participation, there is great potential for contract archaeology to have enhanced cultural and sustainable effects on the heritage landscape, transforming it to an archaeological landscape. Added public interaction, memories and knowledge of a site can strengthen the value in society of the heritage landscape and other sites in the future. Developing effective methods for creating an authentic sense of the site and landscape is essential in this work.

In this paper I present a case study of the mediation and participation in a large-scale archaeological excavation project that was conducted in the northern suburbs of Stockholm in 2016. The project had high ambitions regarding outreach to the local public. One of the challenges for success consisted of the cultural and linguistic barriers with a target group that to a large extent had an immigrant background. I will investigate various methods of mediation/participation and their rate of success, discussing reasons and factors for the outcome and what strategies could be implemented for improvement. Issues on authenticity, relation to place, identity and how public experience of contract archaeology impacts on the future relation to the site are given a central place in the analysis.

8 **THE PAST EXPOSED – DISSEMINATING ARCHAEOLOGICAL RESEARCH FROM THE INSIDE OF A MOBILE CONTAINER**

**Abstract author(s):** Dahlström, Hanna - Jensen, Jane (Museum of Copenhagen)

**Abstract format:** Oral

As curators of archaeological heritage, we want to reach as broad an audience as possible. We also wish to show what happens to

our material after the excavations have finished – how the results from excavations are used in research and contribute to more knowledge in a wider context. As part of the research and public outreach project Urban Encounters, based on the results from three large urban excavations in Denmark and Sweden, a mobile museum was designed, with the aim to disseminate the research themes within the project. This paper will present the ideas and process of creating the mobile museum The Past Exposed and show examples of how it has been used in its three-year lifetime. Challenges, ranging from how to translate complex research into easily accessible outreach formats, to questions of how to show museum objects “on the road” will be discussed. Experiences will be summarized and evaluated for future similar initiatives.

9 **NEW PROCESSES IN CONTRACT ARCHAEOLOGY ARE NEEDED FOR LONG-TERM DISSEMINATION STRATEGIES**

**Abstract author(s):** Dutra Leivas, Ivonne (Linnaeus University)

**Abstract format:** Oral

In Sweden contract archaeology usually follows three steps: survey assessment, field evaluation and finally the excavation phase. The research orientation, regardless which phase it refers to, is decided by the county administrative boards. Today it is common that the county administrative boards, in their specifications, also request for public outreach in mayor archaeological excavations.

In a major archaeological excavation, there are many different circumstances that affect the extent and objectives of public outreach. One factor is how the county administrative boards choose to formulate the specification in reference to public outreach. Another is the archaeological companies’ diverging past experiences and skills in public outreach. Also, the possibilities to receive visitors on the site are a factor, as well as the amount of time that can be set aside for different activities of outreach within the financial framework of the ongoing excavation.

An overview study of practices for public outreach in mayor urban excavations in Sweden shows that mostly of the efforts for outreach are planned to take place in connection to the ongoing excavation. Both, the specifications from the county administrative boards as well as the archaeological companies’ communication plans, show shortcomings when it comes to long-term planning, and didactics approaches intended to last over a longer period of time.

Therefore, there is a need for new processes within contract archaeology that enable long-term strategies for dissemination of archaeological results. Those could be defined in the specifications from the county administrative boards and in the archaeological companies’ communication plans, and maybe already in the evaluation phase for a better long-term planning.

10 **USING ART TO MAKE NON-VISIBLE CULTURAL SITES VISIBLE**

**Abstract author(s):** Knudsen, Nicolai (Østfyns Museer)

**Abstract format:** Oral

With an art installation made of water and light, a viking Ghost Ship appeared at the cultural landscape of Kerting Nor.

The fjord had been a highway for ships in the viking period of Scandinavia. Even though a lot of archaeological evidence have been found to confirm the activity of the vikings, the local community had no consciousness of the history.

Primarily because the evidence was not visible. By building a non-invasive artwork on the location, it was possible to show and tell the forgotten history.

The artwork gave a feeling of ownership to the local population. The challenge of showing and building the artwork from the sea and at the shore was discussed in a close partnership with the museum, volunteers and the municipality.

In the months it was displayed, thousands drove to see the artwork. As a result, of the artwork, the viking narrative and legacy changed from being a forgotten history to suddenly being the main history and a source of identity for the local community.

11 **MAKING CULTURAL HERITAGE ACCESSIBLE TO ALL THROUGH DIGITAL MEDIA**

**Abstract author(s):** Toreld, Christina (Bohusläns Museum)

**Abstract format:** Oral

The cultural landscape consists of places and monuments enriched with history, stories and myths, both tangible and intangible, that all make up our cultural heritage. Many of these places are hidden, remote or protected and therefore very hard to access or understand. And while many people want to play an active part, learn about their history and take advantage of what cultural heritage places have to offer, not everyone has the same opportunity to do so.

Working with 40 different cultural heritage sites in Bohuslän, Sweden, ranging from marine archaeological sites to historical buildings, Bohusläns museum would like to change this. We do not interfere with or change the physical access of the places on site, we are aiming for better accessibility to the places digitally, combined with enhanced experiences on site.

In this paper I would like to present our two-sided approach. On the one hand, we produce accessible digital information about the places, with film, sound and other sensory-focused media, based on stories and facts. This allows one to visit the sites digitally, regardless of one’s physical location and disability. Here, we work together with specialists in accessibility to test the digital information. We also work with focus groups from pre- to upper secondary schools to ensure that the information we publish will be useful in their curricula. On the other hand, we describe the physical access to the places together with TD—the Swedish accessibility



database—to ensure that the cultural heritage places are described sufficiently well to make it easy for people with disabilities to plan visits to Bohuslän's cultural landscapes. By doing this, we strive to meet the objectives of an inclusive society where cultural heritage is a common source of knowledge, education and experiences.

12 **MAKING THE INVISIBLE VISIBLE: INTEGRATING UNDERWATER ARCHAEOLOGICAL SITES INTO EUROPEAN COASTAL PATH**

**Abstract author(s):** Roio, Maili (National Heritage Board of Estonia)

**Abstract format:** Oral

The Baltic Sea is a giant underwater museum, with many well preserved remains of underwater cultural heritage (UCH) sites waiting for visitors. The underwater heritage has an enormous potential as a source of historical information but also for local people to increase attractiveness of the region. In this sense the potential of UCH has not yet been realised and even not known. The main difficulty inherent on sustainable dissemination of invisible underwater archaeological sites is a lack of awareness of its existence - from the general public as well as local authorities. The challenge for archaeologists is the promotion of this unique and sensitive archaeological UCH and its innovative and sustainable use in the economic sector and raising awareness of its universal value.

The European long-distance paths (E-paths) are a network of long-distance footpaths that traverse Europe. Baltic Coastal Hiking is a long distance hiking route, part of E9, along the Baltic Sea coast. The route includes more than 500 natural, cultural and historical objects. Unfortunately, there is no information on underwater archaeological sites. However, one of the challenges for the project Pericles (<https://www.pericles-heritage.eu/>) is the integrating underwater archaeological sites into European Coastal Path.

"A picture is worth a thousand words" –hidden cultural heritage is made more visible using modern technology. 3D documentation methods and results give us a whole range of new opportunities to make research and create underwater experiences for everyone. Is it possible to use 3D models of UCH sites and the existing network of the European Coastal Path for disseminating underwater archaeological sites in a new, innovative way and making the invisible visible?

326 **THE COMPLEXITY OF NEOLITHIC LIVESTOCK MANAGEMENT, DAIRY PRODUCTION, AND FARMING STRATEGIES NORTH OF THE ALPS**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Philippsen, Bente (National Museum of Denmark; Aarhus AMS Centre) - Gron, Kurt (Durham University) - Marciniak, Arkadiusz (Adam Mickiewicz University Poznan) - Sørensen, Lasse (National Museum of Denmark)

**Format:** Regular session

Recent years have seen an increasing numbers of studies of early cattle-based agricultural production, mostly through zooarchaeology, isotopic methods, and ceramic residue analysis. Results have shown that in some regions, dairying was adopted much later than cattle breeding, and in some areas not at all. In other regions, dairying appears to have been practiced from the introduction of domestic stock. This variability underscores the diversification of Neolithic farming practice once agriculture moves north of the Alps.

Initial studies focused on detecting the presence or absence of dairy products, but the field is now ready to explore the complexity of cattle-based farming systems. In particular, the ways in which knowledge could have been transferred within and between societies is of great interest. Specialist knowledge and skills were needed to ensure ongoing productivity, especially if dairying was involved, and to maximize livestock-based agricultural production, so it follows that methods and techniques of production would have changed depending on environmental setting. It should also involve an examination of the character of husbandry traits of different cattle breeds, including milk production and meat quality. This diversification of farming practice would also have had influence on the material culture, for example, in the case of specialized pottery for manufacturing dairy products. It would also have had an effect on mobility patterns, with animals likely being moved for various purposes and at various scales.

To explore the complexity of cattle-based agricultural production, we invite papers that explore the processes leading to the earliest dairying in Europe north of the Alps, and the adaptation of farming to various settings. We invite papers of any applicable method for understanding the interplay between cattle-based agricultural production and prehistoric societies, their economies, mobility, genetics and material culture.

**ABSTRACTS**

1 **THE SPECIFICS OF THE EMERGENCE OF DAIRY HUSBANDRY EMERGENCE IN THE LOWER VOLGA REGION**

**Abstract author(s):** Doga, Natalia (-) - Vibornov, Alexander (-)

**Abstract format:** Oral

According to archaeozoologists, domestic cattle and small ruminants appear simultaneously in most cultures. Until, the emergence of sheep husbandry in the Lower Volga Region was considered to be associated with the Khvalynsk culture, around 4900 BC. However, new evidence suggests that the process of sheep breeding began earlier, ca. 5200 BC in the Precaspian culture. In addition to the bones of sheep, acid residues of dairy products have been identified in lipids from ceramics. There are no indications of wild

sheep in the Lower Volga Region, so these are domestic sheep. However, it is evident that the population of Precaspian culture is non-indigenous and no evidence of cattle have been found. The subsequent Khvalynsk Aeneolithic culture (ca. 5000 to 4500 BC) is an example of a relatively developed production economy. Palynology indicates a warm and humid climate. The unit weight of sheep bones increases at the Khvalynsk sites Kara-Khuduk and Kairshak VI and domestic cattle bones were identified at the sites. Radiocarbon analyses have provided a date of 5000 BC. Lipid analyses of carbon residues from four different ceramic vessels belonging to Khvalynsk culture were carried out. Three of these showed signs of the presence of dairy products of animal origin. Unlike in the Precaspian culture, there is evidence of dwellings in the Khvalynsk culture. One cannot exclude the possibility that relative sedentism is somehow connected with the emergence of cattle husbandry. Remains of wild cattle (aurochs) are common Neolithic artifacts in the Lower Volga Region. Their numbers decrease, however, by the Aeneolithic. Aurochs remains at Khvalynsk culture sites are uncommon or absent. This raises the possibility of domestication of the aurochs by the Khvalynsky culture locally. Thus, in the process by which domesticated cattle appear in the Lower Volga Region (the Balkans or Caucasus) remains an open question.

2 **MORPHOLOGICAL VARIATION IN EARLY AND MIDDLE NEOLITHIC CATTLE ACROSS THE POLISH LOWLANDS**

**Abstract author(s):** Lisowski, Mik (BioArCh, University of York) - Gembicki, Maciej (Department of Archaeology, Adam Mickiewicz University in Poznań) - Zgórski, Adrian - Winkler-Galicki, Jakub - Derebecka, Natalia - Wesoły, Joanna (Department of Biology, Adam Mickiewicz University in Poznan) - Marciniak, Arkadiusz (Department of Archaeology, Adam Mickiewicz University in Poznań)

**Abstract format:** Oral

Different morphotypes of cattle in the Polish Lowlands during the Early and Middle Neolithic are often explained as animals of different degrees of domestication, or populations of different origins. The distinction between the morphotypes is mostly based on the study of size of their bones, but lacks information linking this biometric data to genetic variation between the populations of this region. This research paper is the first stage of an on-going project addressing this issue along with the wider investigation of the origins of cattle-based agriculture in the Neolithic of the Polish Lowlands. In this paper, we explore the variation in morphology and size of cattle from several Early and Middle Neolithic sites across the Polish Lowlands. We investigate the presence of different morphotypes of cattle based on the variation in size and shape of bones using traditional biometric methods, including Logarithm Size Index, and three-dimensional geometric morphometrics applied to astragali and M3 lower molars. In the later stages of the project, the morphological data will be compared to genetic data showing the connection between the morphotypes and DNA of the Neolithic cattle.

3 **NEOLITHIC LIVESTOCK MANAGEMENT AT RACOT 18, POLAND**

**Abstract author(s):** Gron, Kurt (Durham University)

**Abstract format:** Oral

Dated to the latter half of the 5th millennium BC, the middle Neolithic Lengyel settlement Racot 18, Poland, yielded a sizeable faunal assemblage. Comprised of cattle, pigs, and an unusual number of caprines, the well-preserved material presents an excellent opportunity for understanding Neolithic farming systems in Greater Poland. Carbon, nitrogen and sulphur isotope analyses of bone collagen were applied to a number of taxa to investigate feeding strategies and movement. Sequential carbon, nitrogen and sulphur isotope analyses of tooth dentine collagen were applied to investigate annual changes in diet and feeding location. ZooMS was applied to separate the caprines to sheep and goat. Sequential carbon and oxygen isotope analyses of tooth enamel were applied to investigate birth seasonality. The aggregate data indicate a complex and careful system of animal husbandry and illustrate the value of multi-method approaches to Neolithic farming, and the importance of exploring new methods for understanding annual variation in farming practices.

4 **EXPLORING THE MILKING REVOLUTION IN SOUTH SCANDINAVIA DURING THE FIRST HALF OF THE FOURTH MILLENNIUM BC**

**Abstract author(s):** Philippsen, Bente (National Museum of Denmark; Aarhus AMS Centre, Department of Physics and Astronomy, Aarhus University) - Dunne, Julie (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Cordes, Adam (National Museum of Denmark) - Armstrong, Will - Gillard, Toby (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Nielsen, Poul Otto - Sørensen, Lasse (National Museum of Denmark) - Evershed, Richard (Organic Geochemistry Unit, School of Chemistry, University of Bristol)

**Abstract format:** Oral

The Neolithisation of South Scandinavia, comprising the transition from Mesolithic hunter-gatherer lifeways to the establishment of a Neolithic farming economy, continues to be enigmatic despite 150 years of research. In particular, the scale and nature of early farming in the Funnel Beaker culture, the first Neolithic culture in the region, remains poorly understood. While artefact and faunal assemblages as well as lipid analyses indicate a continuation of hunting, gathering and especially fishing on coastal and lakeshore sites in combination with agricultural practices, stable isotopes of human bones show a change in diet towards more terrestrial, likely agricultural, resources with the onset of the Neolithic. These changes in subsistence strategies also resulted in the emergence of lactase persistence particularly concentrated in Northern Europe.

Key sites in the region for understanding the complex transition are inland sites on light sandy soils, which are well suited for agricul-

ture while offering fewer resources for hunter-fisher-gatherers. However, those well-aerated soils are detrimental to bone preservation. Consequently, it is difficult to document the agrarian practices associated with either meat or dairy exploitation of domesticated cattle based on their age and slaughter patterns.

The joint project NeoDairy, between the National Museum of Denmark and the University of Bristol investigates the appearance of a dairy economy through lipid analyses of pottery from inland sites. The results from the lipid analysis, together with social learning theories and establishing modern-day practices of agrarian communities, will be used to document how, where and when a cattle-based dairy economy initially appeared and spread through South Scandinavia. In addition to lipid analyses of c. 500 ceramic sherds from Funnel Beaker sites in Norway, Sweden, Denmark, Germany and Poland, we intend to identify the operational chain of dairy production and the learning processes behind this through experimental practices.

5

## CATTLE HUSBANDRY IN MIDDLE AND LATE NEOLITHIC SWITZERLAND: TRACING AGRICULTURAL PRODUCTION JUST NORTH OF THE ALPS

**Abstract author(s):** Wright, Lizzie (University of Basel)

**Abstract format:** Oral

Switzerland is home to a large number of wetland Neolithic sites from its lowland and pre-Alpine regions. These sites have exceptional organic preservation, resulting in a very rich faunal record from the period c4000-2500 BC, in which cattle are the most common domestic species. In many cases these cattle assemblages have been precisely dated using dendrochronology, so that data can be explored using relatively fine time slices.

The first evidence of dairying is found at the site of Arbon Bleiche 3, which has been dated very precisely to a 15 year occupation period (3384-3370 cal BC). Here the cattle mortality profile shows the distinctive dairying pattern, and organic residue analysis on pottery has confirmed the presence of dairy at the site.

This paper will explore the context of this first evidence within the longer trend of cattle husbandry in Neolithic Switzerland, bringing together cattle evidence from the whole Neolithic time span, and from a variety of geographic regions. Of particular interest is the way in which agricultural innovation spread through the region, which acted as a cultural corridor during the Neolithic period, with Central European influences coming from the north east, and Mediterranean influences from the south west.

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## INTERPRETING ARCHAEOLOGICAL FINDS OF ENIGMATIC TUBULAR BONES AS SOUND INSTRUMENTS: POSSIBILITIES AND PITFALLS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Tamboer, Annemies (Independent researcher) - Rainio, Riitta (Academy of Finland research fellow, Department of Cultures, University of Helsinki) - Mannerman, Kristiina (Archaeology Department Institute of History and Archaeology University of Tartu)

**Format:** Regular session

Those tubular bones from prehistoric times that possess a neatly arranged row of finger holes are easily recognized as flutes by our modern eyes, even when, being incomplete, they lack an element like a window or an edge that can be blown to produce sound. Sometimes one manufactured hole is interpreted as an acoustical element too, but if in our eyes incongruously arranged holes, no holes or no obvious sounding elements are present, these bone tubes are mostly put aside from further investigation as "non-flutes", called "enigmatic" or assigned other functions, such as beads, needle cases or drinking tubes. However, when keeping in mind the diversity of wind instrument types and elements developed through the ages, scrutinizing enigmatic bone tubes can yield previously unthought-of sounding possibilities that would be a pity to miss. Hypotheses pertaining to this type of potential sound instruments are an incentive for further investigation, valuable even if proven unfruitful, and can enrich our image of the soundscapes of cultures long gone.

With this session we would like to bring together archaeologists, ethnomusicologists and instrument makers working on enigmatic bone tubes or bone flutes, whistles, pipes and calls from all time periods and all parts of the world. Our aim is to provide a platform for interdisciplinary encounters and collegial discussion of how to investigate, interpret and bring to life these intriguing but challenging archaeological artefacts.

### ABSTRACTS

1

## ACUTUS' EAGLE BONE AND OTHER WIND INSTRUMENT CANDIDATES FROM A ROMAN FORT IN THE NETHERLANDS

**Abstract author(s):** Tamboer, Annemies (Independent researcher)

**Abstract format:** Oral

In what now is Velsen (The Netherlands, near the North Sea), a Roman army harbour fort existed between 15 and 30 A.D. An attack by Frisians forced the soldiers to flee in a hurry, leaving behind possessions. Among these were some bone tubes that possibly can

be interpreted as wind instruments. One of these is the upper half of a white-tailed or sea-eagle tubular wing bone measuring 12 cm., the proximal joint left intact. It is lacking holes that could suggest it was a flute. A Roman man's name, Acutus, is scratched on, witnessing this is not offal but an object valued by the owner. Flutes made out of bone with an intact joint producing sound by being blown on the rim are known from the ethnomusicological record. A replica of the "Acutus" bone when blown this way does sound indeed. Two other possible wind instrument candidates from Velsen are a stork wing bone and a roe leg bone cut into short open ended tubes with three holes and one hole respectively. The rims are not shaped to facilitate blowing. Comparison with modern animal calls rather suggests these two bone tubes possibly once were provided with a reed. Unworked bones and bone fragments of over 30 wild bird species were excavated at the Roman fort. Apparently the Roman soldiers staying there fowled birds as a leisure activity, at the same time supplementing their diet. A possible interpretation of these three tubular bones as signalling instruments or animal calls used in fowling will be discussed.

2

## SOUND INSTRUMENTS OR NOT – THAT’S THE QUESTION! ABOUT ARCHAEOLOGICAL FINDS IN SCANDINAVIA OF TUBULAR BONE OBJECTS

**Abstract author(s):** Stomberg Lund, Cajsa - Lund, Cajsa S (Linnaeus University)

**Abstract format:** Oral

Archaeological finds of interest to music archaeology are in Sweden documented in five groups according to their probability of having been used for sound production, primarily or secondarily, the Probability Grouping. Group 1 includes objects which clearly are sound instruments, for example bone flutes with finger holes. Others are possible sound instruments on a diminishing scale. Group 5 includes objects with the lowest degree of probability of being sound instruments. This paper will deal with a selection of tubular bone objects excavated in Scandinavia (in this context it means Denmark, Norway, Sweden), which may have been used as flute instruments, that is, they are objects of Groups 2-5. When trying to verify or rectify the preliminary assignment of an object to one of the probability groups, I use a specially devised combination of various theoretical and practical investigative methods, such as scrutiny of archaeological data, analogy analyses, laboratory examinations, and practical experiments. This interpretation model will be exemplified and discussed.

3

## POLISH BONE PIPES AND TUBES

**Abstract author(s):** Poplawska, Dorota (Independent)

**Abstract format:** Oral

In Polish archaeological material from Paleolithic ages to mediaeval times there are a dozen of musical instruments: wind and percussion instruments with several melodic holes. There are also simple bone tubes without such a holes. Some of latter may have been elements of Pan flutes. Other, e.g. double pipes could play the role of simple musical tools. There are also bone tubes with one or double hole, which are most often interpreted as needle cases, but there are some interpretations that they are decoys. Archaeological finds of single, thin, empty tubes without a melodic holes are the most difficult to interpret. However, it is not excluded that beyond every day, ordinary applications such as beads, needle cases etc., some of them could also perform music functions, such as decoys or signaling tools. Studying the musical functions of such pipes and tubes made from bones is one of the most purposes of the presentation.

4

## EARLY MEDIEVAL BONE PIPES: MISIDENTIFICATION, MISCLASSIFICATION AND LOSS

**Abstract author(s):** Taylor, Lucy-Anne (University of Southampton)

**Abstract format:** Oral

Bone pipes are the most numerous instrument found in the archaeological record dating to the Early Medieval period and have been found in many different contexts. However, whenever these instruments are categorised, if they are even realised to have had a musical purpose, they are invariably categorised as bone flutes (with a notable exception of a pair of complete reed pipes from Ipswich). For the bone pipes of the Early Medieval period the term 'flute' usually refers to duct flutes (a pipe where a fipple or duct forces air over the edge of a window, causing the instrument to sound). The instruments classified as 'duct flutes' however often lack the distinguishing window and may in fact represent end blown flutes or reed pipes. The interpretation can change the perception of these past societies and impacts the soundscape and life at the time. This paper will explore this problem and how we should be looking more at these instruments as being voiced in a range of possible ways, not just as duct flutes, with specific examples from the Early Medieval period. In so doing potential features of the types of pipes can be pointed out; these characteristics may also help identify currently misidentified, or unidentified objects as sound devices. Is there a pattern to any of these types of pipes? Were some perhaps made with a particular number, or placement, of finger holes, or style of decoration or bone type, or were they all individually made with little attempt at uniformity among the bone pipes? This paper will not only seek answers to such questions and help towards further understanding these instruments, but will also feature live performance on recreated examples, showing how one find lacking a window can be played in a number of different ways with contrasting sound results.

5

FLUTES, WHISTLES AND OTHER TUBULAR BONES FROM HUNGARY

**Abstract author(s):** GÁL, Erika (Institute of Archaeology, Research Centre for the Humanities) - Daróczi-Szabó, László - Daróczi-Szabó, Márta (Medieval Department, Budapest History Museum) - Tóth, Zsuzsanna (Institute of Archaeological Sciences, Eötvös Loránd University)

**Abstract format:** Oral

Among sound instruments from Hungary, the Avar Period double flutes found in 6th–9th century cemeteries and settlements are the most famous items. They were usually made from the matching pair of tarsometatarsi of a crane (*Grus grus* Linnaeus, 1758), a permanently breeding species in Hungary until the 19th century, but other long bones from this species such as the ulnae and tibiotarsi were also modified. Among hundreds of sites, 11 yielded such kind of artefacts up to date proving that double pipes are rare finds, which do not resemble any bird bone instruments from other periods.

Nevertheless, a number of single flutes and whistles with one or more finger holes were found in other archaeological periods than the period of migrations. As long as music instruments possessing one or a row of finger holes are characteristic of the 1st and 2nd millennium AD (e.g. the Hun and Roman Period as well as the Middle Ages), only simple pipes without holes are so far known from prehistoric sites in Hungary, the oldest one dating back to the Middle Neolithic (6th millennium BC).

In addition to tubular bones interpreted as acoustical elements, bone tubes with two or three incongruously arranged holes were found at a number of medieval settlements. We suggest that they represent pin cases, which were fixed to the purse or cloth of the owner. Pin boxes without holes, but bearing decorative carvings are likewise common finds in Hungary.

The third most frequent type of bone pipes seems to have been the mouthpieces of leather or bladder hoses. These short, simple or carved and often decorated objects are also typical of the Avar period, similarly to double flutes. Such kind of mouthpieces, whose archaeozoological analysis is to be carried out, were found in both female and male graves.

6

ENIGMATIC TUBULAR BONES AS SOUND INSTRUMENTS IN THE EARLY MEDIEVAL CENTRES OF SLAVS IN POLAND

**Abstract author(s):** Kowalska, Milena - Makowiecki, Daniel (Institute of Archeology, Nicolaus Copernicus University)

**Abstract format:** Oral

Enigmatic tubular bones that show traces of being worked by man are not met with frequently among early medieval finds. Moreover these mostly are in a damaged or even fragmentary state, to be recognized among kitchen waste by archaeozoologists. And they quickly forget about them. Some enigmatic tubular bones are noticed by archaeologists and land in a museum. Research and publications often limit themselves to one or a few examples that can be interpreted as musical instruments. We wanted to carry out a scrutiny of a more wide-ranging corpus based on collections and on our own database. Our corpus counts 64 tubular bones from four early medieval sites in Poland, sites that were important political, economic and social centres in the 10th - 13th centuries. We identified tubular bone finds according to animal species, anatomical element and morphology. Finds recognized by us as musical instruments were replicated, played and analyzed acoustically by a computer program.

7

NEEDLE CASE, SOUND INSTRUMENT OR SOMETHING ELSE? A WORKED AND ORNAMENTED SWAN ULNA FROM A LATE MESOLITHIC BURIAL, NW RUSSIA

**Abstract author(s):** Mannermaa, Kristiina (University of Helsinki; University of Tartu) - Rainio, Riitta Rainio (University of Helsinki)

**Abstract format:** Oral

The focus of this presentation is an analysis of tubular bone items made by cutting off the epiphyses of large bird ulnae, such as those found in burials 67 and 69 at Late Mesolithic Yuzhnyi Oleniy Ostrov (Lake Onega, NW Russia). The bone tube from grave 69 was studied systematically, and tested to determine whether it could have been used as a sound instrument. In order to do so, we made a replica of the object, and tested its functions as a flute and a reed pipe. More generally, we propose alternatives to conventional and somewhat unimaginative interpretations of tubular bone artefacts, and raise awareness of their possible acoustic dimension. We discuss the outlook, structure, function and uses of simple bone flutes, whistles and reed pipes, highlighting their most common role as decoy whistles or animal calls. Blown instruments should be kept in mind when looking for explanations of tubular bone artefacts. Sound tools, and especially decoy whistles or animal calls, were common and necessary implements used everywhere and throughout all time periods, especially among hunters and fowlers, and should be considered a basic part of the bone tool assemblage.

8

NEOLITHIC TUBULAR BONE AEROPHONES FROM DUBOKRAJ AND CHORNAYA GORA, RUSSIA. THEIR TONOMETRIC RESEARCH

**Abstract author(s):** Kossykh, Alexei (Independent researcher)

**Abstract format:** Oral

In music-archaeological studies, tubular bone aerophones with fingerholes (bone flutes) are well known artifacts of humanely organized sound in past societies. The findings of bone flutes in Paleolithic sites are usually considered among the earliest evidence of music in Prehistory. In Europe tradition of using bone flutes persisted then to Iron Age to Medieval time to the modern era. In

9

CELTIBERIAN PERFORATED BONES IN THE NUMANTINE MUSEUM OF SORIA (SPAIN)

**Abstract author(s):** Jiménez Pasalodos, Raquel (Universidad de Valladolid / Universitat de Barcelona)

**Abstract format:** Oral

Three perforated Celtiberian animal bones were studied during a survey of musical instruments in the deposit of the Numantine Museum of Soria ( Spain ), on the occasion of the exhibition Sonidos de la Protohistoria ( May - November 2018 ) and displayed as possible sound tools. The first example is an animal bone with three seemingly finger holes, found at the Celtiberian Roman city of Tiermes ( Soria ) and dated to the 1st Century b.C. or 1st Century a.C. The other two examples are a pair of small perforated bird bones, found at the Celtiberian-Roman city of Numantia, and dated also to the 1st Century b.C. or the 1st Century a.C. This last two objects show similarities with other archaeological and ethnographic objects interpreted as whistles. This paper will present the objects and discuss their possible acoustic function, taking into account their morphology, their production process and ethnographic and archaeological parallels.

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‘TUBULAR BONES’: BONE TUBES AS POSSIBLE MUSIC INSTRUMENTS AT THE ANCIENT MAYA CENTRE OF PACBITUN, BELIZE

**Abstract author(s):** Baker, Polydora (Policy & Evidence: National Specialist Services, Historic England) - Cheong, Kong (Department of Anthropology, American University) - Emery, Kitty (Florida Museum of Natural History, University of Florida) - Boileau, Arianne (Florida Museum of Natural History, University of Florida) - Powis, Terry (Department of Geography and Anthropology, Kennesaw State University) - Stanchley, Norbert (AS&G Archaeological Consulting)

**Abstract format:** Oral

Enigmatic bone tubes are not uncommon in the artifact assemblages excavated from ancient Maya sites but they are not recovered in abundance. Only a handful have been excavated from Pacbitun, Belize, including a set of graduated bone tubes from a Late Classic period (AD 700-800) elite male burial, an elaborately carved bone tube from a non-elite burial dated to the Terminal Classic period (AD 800-900), and others excavated from nearby caves. The graduated bone tubes have been postulated as being a set of whistles on the basis of graded size and sidedness, while evidence of a drill hole in the carved specimen suggests this may also be a possible whistle (Healy et al 2014). A summary of the cultural context and zooarchaeological identifications are provided followed by discussion of the modification and association of the bones (eg matchable cores) in relation to production of sound and music making. The symbolism of the faunal repertoire, anatomical elements and body side are considered with reference to parallels from other sites in Belize and the wider Caribbean area. Alternative interpretations of the potential function and meaning are also presented. Finally, the implications for the interpretation of zooarchaeological animal bone shafts are discussed and potential for future study, of both published assemblages and new discoveries, are considered.

Healy, P, Emery, K F, Wagner, T, Hohmann, B, Baker, P and Stanchly, N, 2014 Maya artifacts of bone and shell from Pacbitun, in Healy, P F and Emery, K (eds) Zooarchaeology of the Ancient Maya Centre of Pacbitun (Belize). Trent University Occasional Papers in Anthropology No. 16. Peterborough: Trent University, 97-151.

11

SINGING BONE OR JUST A BONE WITH A HOLE? EXPERIMENTAL RECONSTRUCTIONS OF A WORKED SHEEP/GOAT SHINBONE EXCAVATED IN TURKU, FINLAND

**Abstract author(s):** Rainio, Riitta (University of Helsinki) - Tamboer, Annemies (Independent researcher)

**Abstract format:** Oral

One of few candidates for archaeological wind instruments in Finland is a worked sheep or goat shin bone from Turku, dated 1500-1600 AD. Some features suggest it may have been a wind instrument of some sort. At the wide end of the tapering bone tube the joint is cut off at a straight angle, near the other end a round hole is cut out. Beyond this hole the bone unfortunately is broken off. It is unknown how long the missing part once was and if it carried more holes, or a flute window or other details that allow to decide what type of wind instrument it once was, and if it existed as a finished product at all. Countless sheep/goat shin bones with holes excavated in Europe are more obvious as flute candidates. However, ambiguous as this find may be, we thought it a challenge to explore the nature of this find by experimenting with type models and hypothetical reconstructions.



a. **CORDED WARE CULTURE’S BONE TUBE AS AN AEROPHONE: CASE STUDY FROM SE POLAND**  
**Abstract author(s):** Haluszko, Agata (Institute of Archaeology, University of Wrocław, Poland; Archeolodzy.org Foundation) - To-karz, Dominika (Department of Ethnology and Cultural Anthropology, University of Wrocław, Poland) - Mackiewicz, Maksym (Polish Centre of Mediterranean Archaeology, University of Warsaw, Poland; Archeolodzy.org Foundation)

**Abstract format:** Poster

The interpretation of archaeological artifacts as sound generators is confusing. The uncertainty arises due to simple shape of many objects which are represented by bone tubes. For that reason these types of finds very often are regarded as beads, items for games, containers for needles or dyes, and even tubes for ritual milking and many others.

Studying of the certain features of tubular artifacts may help us to discover their proper function. It seems that the crucial role could play the edge parts, enabling the creation of sound as well as the presence of the characteristic smoothing, bevelling of the edges and appearing of notch on the end.

The subject of our study was an artifact discovered at the Szczepanowice site, Lesser Poland, Poland. The object in the form of a short bone tube was found in in the Corded Ware Culture community’s multi-individual niche grave, next to the skeletal remains of a mature male. The traseological as well as taphonomic study and broader context of similar finds allow as to interpret this tube as a musical instrument.

The research was conducted within the National Science Centre, Poland, project no. UMO-2018/29/N/HS3/00887.

328 **POPULATION DYNAMICS AND ECOLOGICAL INFLUENCES IN EUROPEAN HUNTER-GATHERERS [PAM]**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Posth, Cosimo (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena; Insti-tute for Archaeological Sciences, Archaeo- and Palaeogenetics, University of Tübingen) - Buzhilova, Alexandra (Research Institute and Museum of Anthropology, Moscow State University; Institute of Archaeology, Russian Academy of Sciences) - Spyrou, Maria (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena)

**Format:** Regular session

In the last decade, the field of bioarchaeology has immensely expanded the information that can be retrieved from ancient human remains, and has enriched our understanding of the human past. This session will focus on examples of interdisciplinary research, which lead to new insights on the population history of European hunter-gatherers from the Upper Palaeolithic onwards. For the vast majority of their history in Europe, modern humans relied on a foraging lifestyle, though little is known about the biological differences that existed between different hunter-gatherer groups across time and space. Moreover, toward the end of the Mes-olithic and during the early Neolithic, foragers co-existed with early farmer populations in multiple areas of the continent. As such, hunter-gatherer groups living in temporal and geographical proximity to populations practicing a farming lifestyle, which included a continuous contact with crops and livestock, likely experienced dramatic ecological changes that were accompanied by a higher exposure to infectious diseases. In this session, we focus on hunter-gatherer interconnectivity by using a wide range of techniques including human archaeogenetics, osteoarchaeology and stable isotopes. In addition, we wish to enrich our understanding of hunt-er-gatherer ecology through contributions from the fields of molecular and skeletal palaeopathology. The aim of this session will be to bring together researchers from different disciplines and to create a platform of discussion where correlations between cultural and biological dynamics can be tested. In a time of big data, we envision to promote a synergistic approach, where multiple lines of evidence coupled with innovative methodologies are integrated to bring forward bioarchaeological research.

ABSTRACTS

1 **A MULTIDISCIPLINARY ASSESSMENT OF POPULATION DYNAMICS ACROSS UPPER PALEOLITHIC TO BRONZE AGE SIBERIA**

**Abstract author(s):** Yu, He - Spyrou, Maria (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena) - Karapetian, Marina (Research Institute and Museum of Anthropology, Moscow State University, Moscow 125009, Russia) - Pavlenok, Galina (Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences) - LeRoux, Petrus (Department of Geological Sciences, University of Cape Town) - Roberts, Patrick (Department of Archaeology, Max Planck Institute for the Science of Human History, Jena) - Buzhilova, Alexandra (Research Institute and Museum of Anthro-pology, Moscow State University) - Posth, Cosimo (Department of Archaeogenetics, Max Planck Institute for the Science of Hu-man History, Jena) - Jeong, Choongwon (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena; School of Biological Sciences, Seoul National University) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena)

**Abstract format:** Oral

The Lake Baikal region has been inhabited by modern humans since the Upper Paleolithic and has experienced multiple genetic transitions and admixture events, though the precise history of its inhabitants over this long period and their relationship with con-temporary populations are still largely unknown. Here we report genome-wide data from 19 Upper Palaeolithic to Early Bronze Age

(14.1-3.7 ka) hunter-gatherers from the Lake Baikal and its surrounding regions. An Upper Paleolithic genome shows a direct link with the First Peoples of the Americas and reveals the continuous presence of Ancient North Eurasian (ANE) ancestry in the gene pool of populations from this region. We demonstrate the genomic transition between Early Neolithic and Bronze Age Baikal populations as the result of prolonged admixture between populations related to the local Upper Palaeolithic and East Asian hunter-gatherers throughout the eighth millennium BP. In addition, we detect genetic interactions with western Eurasian steppe populations in one Early Bronze Age individual, and reconstruct Yesinia pestis genomes from two other Early Bronze Age individuals. These individuals lack west Eurasian ancestry and show a non-local signal through strontium isotope analysis but carry Yesinia pestis genomes that cluster closest with European bacterial strains. Taken together, this multidisciplinary project reveals high human and pathogen mo-bility across the Eurasian steppes during the Early Bronze Age.

2 **CONCERNING PATTERNS OF BIOLOGICAL ADAPTATION AMONG EURASIAN PLEISTOCENE HUNTER-GATHERERS**

**Abstract author(s):** Mednikova, Maria (Institute of Archaeology Russian Academy of Sciences)

**Abstract format:** Oral

Vast distribution of humans of different origins across Eurasia (Neanderthals, CroMagnons, Denisovans) during Pleistocene created appearance of different adaptive trends. The key point of biological adaptation to contrasting environments of the glacial age seems to be heat exchange. Taking into account climatic changes of that age and migrations, radiation of cold or warm adapted forms should be reflected in basic patterns of skeletal constitution or even in some microstructural features of skeletal system. A num-ber of European and Altai Neanderthals (from La Ferrassie, Kiik-Koba shelters, from Okladnikov, Denisova and Chagyrskaya caves) and the Upper Palaeolithic humans (Ust-Ishim, Kostenki, Sunghir, Abri Pataud etc.) represent different degrees of cold adaptation. Concerning body size and skeletal proportions as well some microstructural peculiarities given by modern radiological techniques of Neanderthals and anatomically modern humans from Europe and Asia we could argue evidence that the these Pleistocene mankinds were polymorphic in their adaptive reactions, both included cold - and warm adapted forms.

3 **BIOLOGY, PATHOLOGY, AND BEHAVIORS DURING THE GRAVETTIAN: FROM SKELETAL REMAINS TO PALEOETHNOLOGY**

**Abstract author(s):** Villotte, Sébastien (UMR PACEA - CNRS)

**Abstract format:** Oral

- Many archeological sites have produced Mid-Upper Paleolithic human remains, with a significant amount of extremely well preserved skeletons. This corpus represents an amazing resource to discuss the paleobiology, pathology and behaviors of the “hunters of the Golden Age”. Using population studies as well as case reports – especially those on re-cently discovered Mid-Upper Paleolithic individuals from the South-West of France – the aim of this talk is to illustrate the biological characteristics of this extinct human group. These paleobiological data will be used to discuss:
- the morphological homogeneity of the Mid-Upper Paleolithic sample (and the relative agreement between paleobiol-ogists and archeologists);
- the differences between this group and previous and succeeding populations (and the agreements and disagraments between paleobiologists and archeogeneticists);
- the possible causes and implications of the abundance of developmental anomalies in this sample;
- behaviors, life conditions, and social structures (such as the sexual division of labor) in Gravettian groups.

4 **MESOLITHIC HUNTERS-GATHERERS AND FISHERMEN: VARIATIONS OF LIFESTYLE IN AREA OF THE KUBENSKOE LAKE, NORTHERN RUSSIA**

**Abstract author(s):** Buzhilova, Alexandra (Moscow State University; Institute of Archaeology, RAS)

**Abstract format:** Oral

The Kubenskoe Lake is a large water-pool of glacier origin situated to the south from latitude 60° North in the European Russia. Around 170 archaeological sites have been registered in the area (from the Mesolithic to Early Mediaeval time). The Mesolithic materials originate from 10 sites and 4 of them are from the archaeological complex Minino, which represented both by artifacts and human remains. At Minino I and II burials were revealed in the Mesolithic cultural deposit. This is few groups of asynchronous burials performed according to different burial rites (among them 22 single burials, 5 paired burials and 2 triple ones). There were not too many convenient places to settle near the marshy sides of the lake; therefore those suiting habitation was settled repeatedly. For some burial goods parallels can be pointed to Veret’e and Butovo archaeological cultures. But the majority of objects date from a wide chronological span from the second part of the Mesolithic till the Early Neolithic. The finds from the Mesolithic sites enable to reconstruct some details of the ancient population’s everyday life. The anthropological materials, which were studied in bio-archaeological context, enlarged the reconstruction in details. The 39 individuals were investigated by different methods. Several significant variations are noted. A series of male skulls from Minino finds undoubted analogies with the synchronous population of the nearest territories of northern-eastern Europe and more ancient Paleolithic hunters. In the early stages of the development of the region, the population demonstrates high life expectancy, but in the final of it these values decrease. Isotopic analysis of human bones gives the data of diet changing over time. The complex of data give a possibility to discuss some tendency of the changes in

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everyday life of local hunters-gatherers and fishermen.

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### DID TUBERCULOSIS EXIST IN EUROPE AT LATE UPPER PALEOLITHIC? PALEOIMAGING OF AZILIAN HUMAN REMAINS FROM FRANCE

**Abstract author(s):** Coqueugniot, Helene (UMR 5199 PACEA - Université de Bordeaux-Centre National de la Recherche Scientifique; Ecole Pratique des Hautes Etudes, PSL Université Paris) - Palfi, Gyorgy (Department of Anthropology, University of Szeged) - Gély, Bernard (DRAC Auvergne-Rhône-Alpes) - Dutour, Olivier (Ecole Pratique des Hautes Etudes, PSL Université Paris; UMR 5199 PACEA - Université de Bordeaux-Centre National de la Recherche Scientifique)

**Abstract format:** Oral

In the Aven des Iboussières, near Montélimar (France), Azilian burials have been discovered and dated at 10210 ±80 BP (Gely & Morand, 1998). Human remains were associated with rich archaeological material (D’errico & Vanharen, 2000) as well as abundant remains of wild fauna (Chaix, 2005). Human remains represent at least 4 adult males and 5 children. Various paleopathological lesions are observed on these remains (Dutour & al, 1995; Aymard, 2005).

The aim of this paper is to analyse, with modern 3D paleoimaging, the remains presenting lesions suggesting tuberculosis. Two specimens were analysed: a sacroiliac osteoarthritis and a femoral lesion evoking osteomyelitis with cold abscess imprints.

Waiting for molecular confirmation, this hypothesis of presence of tuberculosis among the last Paleolithic European hunter-gatherers should be put into perspective with the evidence of tuberculosis in the Fertile Crescent during the same period among semi-nomadic Neolithic populations (PPNB) which were not yet practicing domestication (Baker & al, 2015).

AYMARD I, 2005 – Etude paléopathologique des vestiges humains aziliens de l’Aven des Iboussières (Malataverne, Drôme). Thèse Doctorat de Médecine, Université de Nantes, 320 p.

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- 6

### “RESIDENTS” AND “VISITORS”: BIOARCHAEOLOGICAL AND TAPHONOMIC APPROACHES FOR MESOLITHIC AND NEOLITHIC HUMANS STUDY FROM THE CENTER OF THE EUROPEAN RUSSIA

**Abstract author(s):** Dobrovolskaya, Maria (Institute of Archaeology Russian Academy of Sciences)

**Abstract format:** Oral

The lifestyle reconstruction is very important for understanding the process of Neolithization in the forest regions of Eastern Europe. An archaeological marker - the presence of pottery, of course, cannot be enough for the study of historical transformation. The term “hunter-gatherer” includes many lifestyle options as well. One of the important aspects of lifestyle studies is the reconstruction of mobility. The indirect evidence and isotopic markers indicate high mobility of human groups from the territory of the Smolensk-Moscow Upland in the beginning - the middle of the Holocene, in particularly. Now numerous sites and settlements are known, but only single burial sites. The burial ground Minino-2 (Moscow region) are associated with the early Holocene period (Sorokin, Hamokava, 2014). The adolescent (male), two females and male were found at the excavation. It is noteworthy that this small group includes males and females by equal numbers. For Mesolithic period this situation is not typical. The isotopic composition of carbon and nitrogen indicates a high-protein diet based on freshwater resources. Similar nutrition was reconstructed both for representatives of the Volosovo Final Neolithic culture (Engovatova et al. 2015, Shishlina, et al., 2016) and the Mesolithic inhabitants of the more northern regions (Wood, et al., 2013). The preservation of skeletal remains let us to assume the diversity of funeral rituals. Funeral rites and taphonomy changes are considered as evidence of the stationary living or its systematic visit in different seasons by human groups of this lake shore area. The long-term memory about burial place - one of the first markers of local territory occupation.
- 7

### BETWEEN HUNTER-GATHERERS AND PRODUCERS: TREPANATIONS IN THE ENEOLITHIC PERIOD IN THE NORTH CAUCASUS

**Abstract author(s):** Berezina, Natalia (Research Institute and Museum of Anthropology, Moscow State University) - Gresky, Julia (Department of Natural Sciences, German Archaeological Institute)

**Abstract format:** Oral

Injuries have always been a part of human lives and the attempts to relieve the effects of skull injuries should have developed the medical skills of primitive healers. One of the forms of assistance was surgical intervention - trepanation.

- In Eurasia, Paleolithic hunter-gatherers were the first to perform trepanations. One of the oldest examples dated to the upper Paleolithic is found in Kostenki 8 site, Russia.

Mesolithic hunter-gatherers performed more trepanations. One of the oldest known operations is a case from Ukraine (Vasilyevka III). Trepanation was performed by drilling the skull vault long before the individual’s death. One of its alleged causes could be an injury that led to a headache, thus the operation was made to relieve it.

Later in in this area, at the early stages of agriculture, this tradition was preserved: Vasilyevka II burial ground is dated to a slightly later time, but the trepanation was performed in the same way as the previous case by drilling.

The Eneolithic period of the Eastern European steppes in 5000-4000 BC was a time of the formation of pastoralism, wide migrations, cultural contacts and social transformations. It was a transition between the hunter-gatherer lifestyle and producing economy. The change in lifestyle could be reflected in the change of spiritual traditions, which may have been reflected in surgical practice.

Eight cases of trepanations dated to Eneolithic period of the south of Eastern European steppes were studied. The holes were described in detail regarding technique, localization, size, shape, state of healing and complications.

The majority of the trepanned long survived the intervention. The region seems to be a center for special trepanations performed by skilled surgeons. According to the localization of the trepanations we suggest both ritual and therapeutic purposes for the operations.

Our acknowledgment to RFBR (Grant #: 17-29-04125) and ARCHCAUCASUS.
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### EXPERIENCING NETWORKS: PRACTICES OF TRADE AND VALUE ASSESSMENT THROUGH TIME AND SPACE

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Poigt, Thibaud (Univ. Bordeaux Montaigne - UMR 5607 Ausonius; Univ. Toulouse Jean Jaurès - UMR 5608 TRACES) - Gorgues, Alexis (Univ. Bordeaux Montaigne - UMR 5607 Ausonius) - Melheim, Lene (Museum of Cultural History University of Oslo; Dept. of Archaeology, Conservation and History, University of Oslo)

**Format:** Regular session

This session is a follow-up of sessions hosted by the same team at previous EAA conferences, which approached the many faces of values assessment (Maastricht 2017) and the reasons and consequences of value destruction in the ancient world (Barcelona 2018). Adding another level, this year’s session aims at exploring the materiality of the institutions surrounding all forms of exchange of goods. By institutions, we mean the various rules, whether formal or informal, enforced by law or based on common knowledge and practice, that allowed for transactions to happen.

The term transaction itself encompasses a diversity of practices, ranging from competitive gift-exchange practices to the on-line shopping, but it has always at its core a notion of value assessment. The situation coinage allows for – optimal possibilities of measurement and comparison of value – is only the tip of the iceberg. Other dimensions of value measurement are to be found in the assessment of the volume or mass of a given product. But beyond these quantitative expressions, the values of a good can reside in its own biography : scarcity, crafting method involved in its making, changing of owner. As previous sessions showed, such value(s) can or cannot be measured, and can or cannot be commensurable. Often a shift from commodity to gift or vice versa occurs when objects move across cultural boundaries. This implies that gifts and commodities cannot be a priori separated, and also; that trade and gift exchange are intertwined and often coexistent.

We would like to invite to this session any paper interested in exploring the diversity of value assessment and exchange practices and dealing about all archaeological periods and every part of Europe. All perspectives are welcome : archaeological or ethno-archaeological point of view, theoretical perspective or specific case-studies, and methodologies developed for exploring such topics.
- 1

### A SMALL-CREDIT REVOLUTION? TESTING THE MONEY-HYPOTHESIS ON COMPLETE AND FRAGMENTED OBJECTS IN EUROPEAN BRONZE AGE HOARDS

**Abstract author(s):** Ialongo, Nicola (Georg-August University Goettingen) - Lago, Giancarlo (University of Rome ‘La Sapienza’)

**Abstract format:** Oral

What is the rationale for the use of money in pre-literate economies?

In the Bronze Age of the Near East and of the Aegean, the use of metals as mediums of exchange and standards of value is documented by both textual and archaeological evidence. The hypothesis was proposed several times for pre-literate Bronze Age Europe, but it was never tested through a strict methodological framework, based on a large sample.

In this paper, we will propose a theoretical and methodological framework to test the money-hypothesis in pre-literate economies, based on analogies with the material characters of commodity-currencies in the Ancient Near East. The statistical properties of metals from European hoards are compared with those of balance weights, in order to test the following expectation: if they were used as money, complete objects and fragments should comply with standard weight systems. The results indicate that bronze



fragments (much more than complete objects) possess the same statistical properties as hacksilver money in the Ancient Near East.

The sample of metal objects includes approximately 3000 items, collected from two test-areas in Europe: Italy and Northern Germany. The sample of balance weights includes all the items known to date for pre-literate Bronze Age Europe (c. 500), collected in the framework of the ERC Project “Weight and Value” (Göttingen, DE).

2

## VALUE AND TRADE IN A LIMINAL SPACE. AN APPROACH TO PRODUCTIVE STRUCTURES OF THE CONTESTANIAN COAST IN THE IBERIAN AGE

**Abstract author(s):** Perdiguero-Asensi, Pascual (Universitat d’Alacant)

**Abstract format:** Oral

The coast of the south-east of the Iberian Peninsula has always been an interesting case of study for the non-canonical ways of interaction between the Mediterranean and the local population. Several sites in this area show a consolidated productive network during the Second Iron Age, and a strong connection with the Mediterranean markets.

In this paper we intend to defend the importance of local production in the colonial processes of trade and exchange. Through the analysis of archaeological data, we reflect on this productive network as a link between asymmetric socioeconomic systems, of varying degrees of complexity. This is proving essential to understand colonial situations in the Contestanian region. However, this paper doesn’t try to reach solutions to this historiographical problem but to establish a basis on which to continue our research.

The archaeological data characterises the productive system established by the Contestanian coast as a network of workshops specialised in the production and transformation of a wide range of raw materials into high value products that can be shipped towards the Mediterranean. It seems that the influence of the Mediterranean market economies has been one of the main drivers of productivity development in this region since the 8th century BC with the establishment of several Phoenician colonies and increased during the decades before the II Punic War.

Furthermore, the concentration of amphorae kilns in this region further proves an intensive productive network destined mostly to the shipment of products and goods towards the inland and the Western Mediterranean. We have been able to identify the presence of this amphorae in most of the closest economic nodes. The way this trade is organised shows a very specific model of colonial interaction and proves the high value of certain elaborated goods through the 6th to the 3rd centuries BC.

3

## THE MATERIALITY OF TRUST. INSTRUMENT OF INTERACTIONS IN MEDITERRANEAN LATE PREHISTORY

**Abstract author(s):** Gorgues, Alexis (University of Bordeaux Montaigne) - Poigt, Thibaud (UMR 5607 Ausonius; NOSTOI project)

**Abstract format:** Oral

Trust is essential to commerce, and more broadly to any type of transaction. But trust is a construct, which can vary from one socio-economic context to another. The two extremes are what can be called interpersonal trust on the one hand and systemic trust on the other. Interpersonal trust” is trust based on reputation and honour, on mutual experience. Interpersonal trust lays in the faith one have on the sincerity of his/her partner. We will define “systemic trust” as trust based on the existence of a law, the fact that political authorities provide an institutional framework for trade. In this case, trust proceeds from the fact that fraud can be prosecuted and punished. Both faces of trust have a specific materiality, in fact linked with the nature of the information transmitted during the transaction: declarative in the case of interpersonal trust, based on measurement and standard metrology -on conventional units- in the other case. Systemic trust is deemed necessary to anonymous interactions, in other word to market economy. We would therefore have a market anywherewe material elements allowing for standard measurement (weighing, volume control, etc.) are to be found. However, interpretation of the material record is trickier than it appears. In this paper, we will try to demonstrate through some case studies that its interpretation is indeed context-dependent. As we will show, Iron Age Mediterranean provides examples showing that situation was complex and fluid through time and space.

4

## VALUING ROTARY QUERNSTONES IN 18TH CENTURY ICELAND

**Abstract author(s):** Beck, Sólveig (University of Iceland)

**Abstract format:** Oral

In late-18th century Iceland a governmental decision was made to start importing unground grain and revive indigenous quernstone production. Rotary quernstones had not been imported to the island for a long time and local production of querns was minute and highly localized. The local production was taken up and maintained by subsistence farmers and farming craftsmen and the rotary quernstone became an important part of the Icelandic economy up until the early 20th century. Icelandic goods exchange was directed by fixed internal price regulations and traditions called Búalög. They held fast for 700 years, from the 12th to the late-19th century, and were recorded in some detail as early as the mid-17th century. Product value in both internal and foreign trade was generally measured in standards of fish or homespun cloth but in internal trade, general products were often exchanged for staples such as food, tools and utensils, more raw materials or for work, and commissioned work was usually paid for in the same way. The aim of this paper is to provide a glimpse into these old price regulations and traditions through the Icelandic rotary quernstone by dissecting in detail how it was produced, transported, priced and exchanged. The analysis is based on seven years of research into available historical sources regarding the quernstone revival’s execution in the 18th century, the availability of indigenous raw materials and

detailed analysis of the Icelandic 18th-20th century quernstone collection. Quernstone production was a modest addition to the average subsistence farmer’s repertoire. The querns could be acquired at varied prices, depending on whether they were foreign or locally produced and the level of complexity in their composition, which made them accessible to all levels of society.

5

## THE METROLOGICAL TOOL BOX : OBSERVING AND ANALYSING METROLOGICAL DATA FROM AN ARCHAEOLOGICAL POINT OF VIEW

**Abstract author(s):** Poigt, Thibaud - Gorgues, Alexis (Univ. Bordeaux Montaigne - UMR 5607 Ausonius)

**Abstract format:** Oral

The studies of ancient economics and trading practices generally implies the use of common metrological standards or the sharing of basis concepts on the way the value is assessed by the different characters. However, despite of the quantal analysis – the so-called Kendall formula – the classic statistical approaches are useless when it comes to analyse samples with a supposedly metrological structure. For this reason, most of the hypothesis about metrological knowledge in ancient times relies on simple pre-suppositions or on specific contexts with large samples – as in the Eastern Mediterranean during the Bronze Age.

The concept of a Metrological Tool Box was born out of the need of a common and uniformized method to question metrological data which could be used by anyone, specialist of the metrological topic or not. It has been developed and updated on the framework of a PhD thesis dealing with weighing instruments during Metal Ages in Western Europe and two projects about amphorae manufacturing and trade.

In this paper, we will present the main features of this analytical tool and some case studies about weight, volume and control in Late Prehistory.

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## CERAMIC IS FANTASTIC: THE LIFE-CYCLE OF POTTERY THROUGH CROSS-DISCIPLINARY STUDIES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Debels, Pauline (University Paul-Valéry Montpellier 3, UMR 5140 ASM; University Paris 1 Panthéon-Sorbonne, UMR 8215 Trajectoires) - Jean, Mathilde (University Paris 1 Panthéon-Sorbonne, UMR 7041 Vepmo) - Delbey, Thomas (University of Southern Denmark, Department of Physics, Chemistry and Pharmacy, CHART) - Delvoye, Adrien (University of Geneva, Department Genetic and Evolution, Anthropology; Fysyen Foundation)

**Format:** Regular session

Almost 50 years after Schiffer’s model (1972), how is the life cycle of potteries addressed by current research? From manufacture to post-depositional alterations through uses, recycling and maintenance, and discard of the ceramics, numerous studies have mainly focused on specific stages of the model or on particular methodological approaches.

This session is primarily dedicated to methodological reflection on ceramic. Developments in pottery analysis took different paths depending on time period, culture or region. It is of great interest to interact regardless of spatiotemporal fields and to compare recent researches to improve our archaeological practices.

By gathering studies addressing the “chaîne-opératoire” of making potteries and the “chaîne-opératoire” of consuming potteries, this session wishes to discuss the life cycle of pottery, above the limits of academic fields. Following Braun’s inquiry to reconsider “pots as tools” (1983), the study of ceramics is addressed beyond the traditional dichotomy between the finished product and the used product.

A wide array of methods is used to reveal the archaeological and anthropological value of ceramics. Petrographic and geochemical analysis may document the provenance of the raw materials, taphonomic alterations, and, along with technological study, the processes of pottery production. Shapes and decoration styles are the basis of typochronological classifications, while use-wear studies and residues analysis investigate the “pot’s life” during its use and discard. Finally, experiments and ethnoarchaeological data provide possibilities to compare archaeological pottery with contemporaneous data.

The aim is to share and combine innovative or well-established methods, in order to create a cross-disciplinary and trans-cultural approach of ceramic analysis. Based on worldwide case studies, the participants would discuss their methodology and how they designed their protocols regarding their problematics. Beyond summarisation of recent advances in ceramic analysis, homogenisation of methodologies and vocabulary is now a key issue to make works comparable.

## ABSTRACTS

1

## SAME SHAPE, SAME PROCESS, SAME POT? THE STANDARDIZATION PHENOMENON THROUGH THE EYES OF TECHNICAL STUDY

**Abstract author(s):** Verdelle, Cécile (CNRS - UMR7041 / Haroc)

**Abstract format:** Oral

During the 3rd millennium BC in Mesopotamia, the progressive standardization of pottery production is often understood as a consequence of the beginning of a relative cultural homogenization of the area. This trend is well exemplified by the Carinated Bowl,



symptomatic of the expansion of a long-distance trade and a well-organized exchange system. Indeed, this type, which appeared in the second half of the 3rd millennium and extended all over the Near-East, must have had a specific use like measuring quantities.

Through the specific case of Kunara, late 3rd millennium BC city, located on the Mesopotamian border on the Zagros foothills and excavated by A. Tenu since 2012, we are questioning the concept of standardization by a detailed analysis of such a type. Were the Carinated Bowls made only for their particular function - which means that their main feature was their shape - whatever the making-process was? Or does their production include the learning of a specific process and therefore, a possible change in the pottery tradition?

In addition to typological classifications and petrographical observations, we wish to address this issue with technical analysis, which focuses on the “chaîne opératoire”. Our method is based on comparisons of technical traces visible on the bowls from Kunara with these from other sites, including Assur, thanks to the welcoming of B. Helwing (Vorderasiatisches Museum, Berlin). Through macroscopic observations and identification of characteristic traces, we aim to bring to light the possible specificities of local making-process.

Combining typological and technical analysis should enable us to identify variations in the technical process of a pottery type which looks standardized. By tracing the process of local adaptation, this study will add to the understanding of the complexity of a period of important economic, social and political changes in Mesopotamia.

2 **BETWEEN EAST AND WEST: COMBINED ANALYSIS OF STYLISTIC AND TECHNOLOGICAL ASPECTS OF POTTERY AT THE NEOLITHIC SITE OF BURGÄSCHISEE-NORD (SWITZERLAND)**

**Abstract author(s):** Hostettler, Marco (Institute for Archaeological Sciences, University of Bern) - Charnot, Marie (UMR 6298 ARTEHIS) - Stapfer, Regine (Archaeological Service of the Canton of Bern) - Emmenegger, Lea (Freelancer) - Hafner, Albert (Institute for Archaeological Sciences, University of Bern)

**Abstract format:** Oral

The wetland site of Burgäschisee-Nord is located on the northern shore of the small lake Burgäschi in Central Switzerland. It is one of several Neolithic sites located at the lake shore and has been newly excavated between 2015-2017 within the framework of the international and interdisciplinary project “Beyond lake villages. Studying Neolithic environmental changes and human impact at small lakes in Switzerland, Germany and Austria”.

During the 37th century BC, the site Burgäschisee-Nord is culturally located between two regions each associated with a specific pottery style (eg. Western Switzerland with the so-called Cortaillod style and the region of lake Zurich with the so-called Pfyn style). Both stylistic influences are reflected in the ceramics of the sites at lake Burgäschi, however in Burgäschisee-Nord (3700-3650 calBC) an unexpected quantity of pots is produced in a style related to eastern Central Switzerland (Lake Zurich region).

To conduct an in-depth study of these stylistic interrelationships a crossed-analysis was applied, combining stylistic, technological and petrographic methodologies.

The technological analysis, based on the reconstruction of the “chaînes opératoires”, shows comparable results to the stylistic study of the material. For example, the surface treatments of pots in Burgäschisee-Nord are close to those identified on pots of settlements around lake Zurich. Nevertheless, the techniques of shaping refer to both the regions of Western Switzerland and Lake Zurich. The petrographic analysis reveals that the analysed ceramics have been produced with local raw materials, without having a relation to stylistic features.

The combined approach allows us to draw a more profound picture of the pottery production at lake Burgäschi in the 37th century BC and its entanglements with Western Switzerland and the Lake Zurich region.

3 **WHAT CERAMIC TECHNOLOGY BRINGS TO THE UNDERSTANDING OF THE BELL BEAKER PHENOMENON ?**

**Abstract author(s):** FAVREL, Quentin (Université Paris 1 Panthéon-Sorbonne; UMR 8215 Trajectoires)

**Abstract format:** Oral

The “Beaker Complex” (Heyd, Fokkens, Kristiansen, Sjögren 2018) takes place in Western and Central Europe in the middle of the third millenium BC. The term encompasses a wide ceramic production in space and time. But few ceramic technology studies have been made since the pioneering works of S. Van der Leeuw in the Netherland (1976) to explain these differences. Most of the time, typology remains the only approach when dealing with ceramics, despite the huge potential of information ceramic technology could bring to the debate.

Accounting for the variability inside the material culture, A. Gallay divided the Beaker Complex in different networks (Gallay 1979; 2001), following the polythetic models of Clarke (1968). But the relationship between the local culture of the Late Neolithic/Copper Age and what we call today the “Bell Beaker Phenomenon” (Lemercier 2018), or even between the different Bell Beaker networks, seems always more complex, as movement of people, sharing of know-how, diffusion of idea blurred the lines. It is necessary to deepen previous analyses by adding a new dimension to the debate.

Thus, we made comparatives researches upon the chaînes opératoires of Bell Beakers and Late Neolithic ceramics in Northwestern France to define traditions for the local potters of the Late Neolithic and Bell Beakers potters. The aim is to compare them in order to measure the changes brought by Bell Beakers potters over time. In addition, a study about investment in crafting process comparing

the thickness, symmetry, surface treatment, decoration meticulousness and firing process of ceramics was conducted, because copies of Bell Beakers or phases of apprenticeship were suspected.

These approaches bring interesting, as well as unexpected or sometimes disappointing results. Discussing the latter case might be the key in order to get a better understanding of the Bell Beaker phenomenon.

4 **TIME’S ARROW, NETWORKS, CORDED WARE CERAMICS, AND OTHER UNLIKELY PROTAGONISTS: A NETWORK ANALYSIS OF THE CERAMIC CHAÎNE OPÉRATOIRE**

**Abstract author(s):** Kroon, Erik (Leiden University, Faculty of Archaeology)

**Abstract format:** Oral

The chaîne opératoire approach to ceramics has become a crucial tool for shedding new light on the drastic transformations in Europe during the third millennium BC. Can we detect continuous use of production techniques throughout this millennium, or not? And what does this imply about the nature of these transformations?

However, the widespread adoption of this approach elicits a number of new, problematic questions. How to compare chaînes opératoires? On a categorical basis, through diagrams, or though phylogeny? How to relate observations on individual vessels, or even sherds, to such comparisons at the level of ceramic assemblages? How to strike a balance between approaches that emphasise creativity and fluidity, and approaches that focus on stages as a heuristic?

In this paper, I address these issues by outlining an approach to the ceramic chaîne opératoire that incorporates network analysis. Network analysis visualises and analyses the structure of relations between data. Using this approach, I want to explore the structure of the ceramic chaîne opératoire, how individual observations fit into these structures, and how we can exploit such structures to compare various production processes. Throughout this paper, I draw on a study of the transition from Funnel Beaker Culture to Corded Ware Culture in the Netherlands during the third millennium BC. This study incorporates macroscopic analysis, petrography, and provenance analysis of ceramics.

5 **IRON AGE POTTERY PRODUCTION IN THE PYRENEES: THE CASE OF STUDY OF BALTARGA, CerdANYA**

**Abstract author(s):** Alliot, Pascal - Morera, Jordi - Oller, Joan - Olesti, Oriol (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona)

**Abstract format:** Oral

Typochronological and technological approaches have long played a major role in the studies of ceramic materials, in addition to a wide range of more recent interdisciplinary methods which are currently applied worldwide. However, there is a total lack regarding the Iron Age handmade productions in the Pyrenees, despite these constitute the main pottery group in this region.

This study reports the results of first typochronological analysis of handmade ceramics from the Late Iron Age occupations of Baltarga, in Bellver de Cerdanya, spanning from the fourth century to the first century BC, where handmade potteries constitute around 70-80% of the total ceramic production recorded.

The studied assemblages exhibit a high variety of shapes, morphologies and decorations which may reflect non-standardized domestic production modes. Similarities with handmade potteries from southern Gaulle were also noticed and further discussed. This pioneering typochronological study in Baltarga represents a first step towards the standardization of this important group in the Iron Age pottery production of the Pyrenees.

6 **INDUS POTTERS FROM THE MID-3RD MILLENNIUM BC IN OMAN AND THE UAE? RESEARCH STRATEGIES, METHODS, AND RESULTS**

**Abstract author(s):** Sophie, Méry (CNRS) - Kenoyer, Jonathan (University of Wisconsin-Madison)

**Abstract format:** Oral

Ceramic styles and technology have long been mainly used to track interaction within eastern Arabia and surrounding regions during the prehistoric period. The discovery of new sites and ceramic forms require supplementary scientific techniques as well as new interpretive models. The cumulative results of long term research on the trade and production of selected ceramics during the 3rd millennium BCE will be presented with a focus on the Umm an-Nar Period. Samples presented in this study were collected from more than 30 sites in Oman, UAE, Pakistan and India and were analyzed using stylistic and technological approaches as well as petrographic and chemical compositional analysis (Instrumental Neutron Activation Analysis - INAA). By combining the scientific analysis with the study of clay recipes, shaping, finishing, it is now possible to identify; 1) vessels imported from two or more geographical regions of the Indus Civilization; 2) Indus pottery and Umm an-Nar domestic pottery produced by Indus trained potters; 3) the local production of other domestic pottery styles that have not been noted in the past. The main focus of this presentation will be on pottery from central Oman (Salut, Bat, and Amlah) and the eastern region of Abu Dhabi Emirate (Hili).

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CERAMIC ASSEMBLAGE OF NEOLITHIC SETTLEMENT WUTAISHAN (NORTH-EAST CHINA): CLASSIFICATION AND INTERPRETATION

**Abstract author(s):** Pauline, DUVAL (Ecole Pratique des Hautes Etudes - EPHE; Jilin University)

**Abstract format:** Oral

In 2017 and 2018, excavations were conducted in Wutaishan site, in Jilin province, North-East China. It provided a large Neolithic ceramic assemblage from 5th millennium B.C.. This corpus is remarkable by its quantity (116.699 of sherds for 1210kg) and decoration diversity - with over 40 variations. This research was carried out by using descriptive statistical analysis on all the sherd, classifying the potteries according to the chaîne opératoire concept and analyzing petrographic samples.

Throughout the initial sorting phase four major groups have been defined through naked eye observations of the ceramic paste and the decorations. The 1st group (92% of the total sherds), is characterized by superfine inclusions in the paste and twisted incisions patterns, the 2nd group (5%) is defined by a dense concentration of fine inclusions in the paste and a impressed lines patterns, the 3rd group (2%) is uniquely defined by a shell inclusions paste and added cordons patterns, and the 4th group, dating from the Bronze Age period, is identified by a dense concentration of coarse inclusions.

In order to test this typological hypothesis and understand the nature of the variations (technical, stylistic or functional), potteries were classified by technical groups and 25 samples of cylindrical jars were used to carry out a techno-petrographic analysis. Preliminary results show that the Wutaishan site contains a heterogeneous ceramic assemblage originating from at least four distinctive social group from different areas.
- 8

LBK SOCIETY AND CERAMICS IN SOUTHERN POLAND: AN EXPERIMENTAL AND TECHNOLOGICAL EXAMINATION OF TEMPERED VESSELS

**Abstract author(s):** Palacios, Olga (Autonomous University of Barcelona; University College Dublin)

**Abstract format:** Oral

The study presented will investigate the role of organic temper in ceramic vessels in the Linearbandkeramik culture (LBK) in southern Poland (5500-4500 cal. BC). According to the literature, a social change occurred at the beginning of the middle LBK, when organic inclusions (e.g. bone, chaff) were substituted with ceramic additives and quartz inclusions. This change in raw material selection has been traditionally related to symbolism and tradition, an interpretation difficult to see in the archaeological register and which cannot be considered valid without examining other possible hypotheses. This study revolves around a central question: Why were organic inclusions substituted by mineral and ceramic additives in the Middle and Late LBK periods in Southern Poland? The methodology employed combines experimental archaeology and laboratory tests typically designed for engineering materials (e.g. three-point bending test) with the objective of evaluating all the possible interpretations to explain this change. As a result, relevant insights were obtained about the production process of prehistoric pottery and the technological properties of different ceramic 'recipes' determining the vessel's function. Importantly, the dichotomy between modern specimens tested in the laboratory and the archaeological sherds studied in archaeology will be presented, evaluating how this can be approached to obtain representative results.
- 9

LATE NEOLITHIC POTTERY FROM A NW IBERIAN DOLMEN: PRODUCTION, USE AND REJECT

**Abstract author(s):** Castro González, M. Guadalupe - Martínez Cortizas, Antonio (Universidad de Santiago de Compostela) - Kaal, Joeri (Universidad de Santiago de Compostela; Incipit, CSIC) - Prieto Martínez, M. Pilar (Universidad de Santiago de Compostela)

**Abstract format:** Oral

This contribution will present the results of the study of the Late Neolithic pottery documented during the excavation of the “Dolmen 4” of the Guidoiro Areoso islet, that is located in Arousa bay (Pontevedra), one of the most important archaeological areas in the Prehistory of Galicia. The site was in constant use from 4600 BC to 800 BC, which includes diverse funerary and ceremonial uses. This study, focuses on the reconstruction of the vessels's "life" (their manufacture, use and reject), has two basic methodological blocks: one is based on the archeological features of the pottery and another that focus on analytical work.

The archaeological part of the study includes the analysis of the morpho-technical features of the pots, their spatial distribution at the site and the type of context in which they were found. The analytical work included archeometric techniques like XRF, XRD, FT-IR-ATR, thermochemistry and solid's colorimetry, allowing us to complete the information about the first steps of the pots biography related to their manufacture.

The results of this research will provide us a better understanding of the funerary ritual of this megalithic burial from a material and sociocultural point of view. In addition, a comparative study with other sites in the NW Spain will allow us to start the characterization of the Late Neolithic pottery of the region, a matter that is still poorly addressed.
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LIFE-CYCLE OF ANGOSTO CHICO INCISO VESSELS. DIFFERENT METHODS IN THE ANALYSIS OF A PARTICULAR STYLE FROM QUEBRADA DE HUMAHUACA (ARGENTINA)

**Abstract author(s):** Scaro, Agustina (Institute of Andean Ecorregions - CONICET-UNJu)

**Abstract format:** Oral

Ceramics are part of the material dimension of practice, inserted into a process by which human objects and agents are reciprocally

constituted. In this way, both daily activities and everyday objects are socially significant. Therefore, it is necessary to focus on a broader aspect of social life that goes beyond “the symbolic”. In this sense, a comprehensive ceramic analysis that integrates stylistic, technological and functional aspects is relevant to understand social, symbolic and ideological dimensions in everyday activities of the groups that developed and consumed ceramic vessels. Within this framework, the interrelated analysis of functional, technological, morphological and iconographic aspects allows understanding how a particular way of doing was configured and use.

Angosto Chico Inciso was considered one of the local late pre-Hispanic ceramic styles of Quebrada de Humahuaca (North of Argentina), although its foreign origins and the great variety within the style was soon evidenced. Recent petrographic studies have shown that these vessels present both a local and foreign manufacture. In this paper we present the analysis of Angosto Chico Inciso ceramics recovered in a sector of Quebrada de Humahuaca, considering diverse approaches to determine the stylistic variety within this group of vessels, their technological traits and the function they could have had in different pre-Hispanic moments. Stylistic studies that consider iconographic and morphological aspects, technological and use-wear analysis were carried out in 38 fragmented vessels from Esquina de Huajra, Pucara de Volcán, and El Pobladito sites, covering pre-Inca and Inca occupations. Studies determined the production and use of Angosto Chico Inciso vessels as early as the 13th century, both in domestic and public contexts. These vessels correspond to local and non-local manufacturing. Stylistic and technological studies have revealed the presence of two modalities of Angosto Chico Inciso that correspond to the two different manufactures.

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CERAMIC IS THE KEY – NEW STUDIES ON BRONZE AGE POTTERY FROM THE SOUTHERN URALS

**Abstract author(s):** Schreiber, Finn (Free University Berlin)

**Abstract format:** Oral

Ceramic studies have been an integral part of the prehistoric archaeology of the South Urals for a long time. Pottery is usually used to identify archaeological cultures and to reconstruct migration. This has led to a large number of related cultures within the South Urals and beyond, while their chronological relationships are only vaguely understood. Current scientific studies in this area therefore work on a rather rough chronological scale.

In this paper new results of multivariate statistical studies on Bronze Age burial ceramics in combination with radiocarbon dating are presented, suggesting pottery as a suitable chronological marker. This not only allows a redefined chronology, but also provides a more detailed image of burial customs in the South Urals. On this basis, new questions can be asked and previous theories can be challenged. It is also discussed how the life cycle of the pottery and the specific archaeological context can influence these results.

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THERMOLUMINESCENCE DATING OF PRE-COLOMBIAN CERAMICS FROM THE US VIRGIN ISLANDS

**Abstract author(s):** Delbey, Thomas - Rasmussen, Kaare Lund (University of Southern Denmark, Department of Physics, Chemistry and Pharmacy, CHART)

**Abstract format:** Oral

The history of ceramic production in the US Virgin Islands in the Caribbean is strongly related to archaeological models involving migration of peoples from the Orinoco valley in south America during the 1st millennium BCE and marking the beginning of the Ceramic Age in this area known archaeologically as the Saladoid culture. The first Saladoid settlements in the Virgin Islands are usually dated around 500 BCE and are typically identified according to a set a well-fired and thin-walled ceramic vessels with different decoration techniques. Changes in the ceramic assemblage was usually interpreted as a change or a merge of cultures as a consequence of a new migration wave according to the “Four ages culture-historical system” introduced by Irving Rouse during the second half of the 20th century. However, recent investigations in Caribbean area show that rather than a geographical and chronological homogeneity of these cultures, dynamic models of migration and diffusion of goods involving intensive exchanges between islands create a more complex cultural and material pattern. The thermoluminescence dating of 160 ceramic samples from the Virgin Islands founded in 8 archaeological sites and curated by the National Museum of Denmark show results heading in this most recent direction. Even though these new dates generally fit with the classic typo-chronology, several striking examples of inadequacy are displayed and seem to confirm the paradigm of a dynamic interactions reflected by local and diachronic evolution of the ceramics in Caribbean islands.

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POTTERY, LANGUAGE AND CULTURAL BASIN: A NEW MEANING IN A NEW CONTEXT

**Abstract author(s):** Novakova, Lucia (Trnava university in Trnava) - Heidari, Ahmad (Islamic Azad University, Birjand Branch)

**Abstract format:** Oral

Cultural basin is one of the scientific categories in archaeology used to classify and interpret the cultural data of a region. Archaeologists believe that climate, geography, and other factors have a significant influence on the formation of the shapes and patterns of pottery and other human artifacts. A cultural area is a territory for examining the similarities and differences in cultural elements used in archaeological data. Therefore, a specific chronology chart for each cultural area is needed. This study examined the impact of dialect and language on the formation and separation of pre-historic cultural areas. The case study is the Lorestan Province in the west of Iran. By examining pre-historic pottery and the distribution of the present ethnicities by dialect in pristine and hard-to-reach areas in the Lorestan region, it can be concluded that every type of pottery, in terms of form and pattern, indicates the existence of a dialect or language in that territory and may match the distribution of the present ethnicities on the basis of dialect.

a. **KNOWN BY FINGERPRINTS: THE INPUT OF DACTYLOSCOPY TO SHED LIGHT ON THE SOCIAL ORGANIZATION OF POTTERY PRODUCTION IN POMPEII**

**Abstract author(s):** Lambert, Aurore (Eveha; UMR 7268, Aix Marseille université, efs, CNRS) - Desmarais, André (Laboratoire archeorient, MOM, Université de Lyon, CNRS)

**Abstract format:** Oral

Ancient fingerprints have been recorded around the world but there have been only a few academic studies that focus on using them to interpret archaeological contexts. Fingerprints appears on various mediums, though ceramic artifacts are the most common. Our purpose is to investigate the social organization of ceramic production in two Pompeian ceramic workshops thanks to a fingerprint analysis of the marks left by potters : individual identification, gender roles and learning curve. In Pompeii, excavations led by L. Cavassa allowed the understanding of the chronology, the chaine opératoire and the kind of production of a ceramic workshop along the Via dei Sepolcri and of a oil lamp workshop in Reg. I, ins. 20, 2-3 (Porta Nocera), in 79 AEC. Among numerous traces, we have sight more than 100 marks. Moreover, one of our interest was to try and follow the products’ consumption and people’ spending habits in the city for the ceramics products. The fingerprints identification was carried out both by naked eye by a forensic specialist and using an automated fingerprint identification system according to a protocol that we have developed.

Unlike our previous case, the fingerprint typological classification rate is low and no technical identification was possible despite the two approaches. The type of product studied and the manufacturing techniques are the main causes of such results. Our work underlines the interest of the choice of archaeological artifacts to study ancient fingerprints and highlights the technical points to consider before attempting to establish social hypotheses: deformation of the clay, quality of pictures, use of advance technics such as RTI....Our novel multi-disciplinary investigation shed light on the possible contribution of the fingerprint data to interpret archaeological context and its specifics.

b. **MACROSCOPIC CLASSIFICATION AND PETROGRAPHIC ANALYSIS OF EARLY IRON AGE COOKING POTTERY FROM SOUTHEAST IBERIA: PRELIMINARY RESULTS**

**Abstract author(s):** Cutillas Victoria, Benjamin (University of Murcia) - Day, Peter M. - Testolini, Veronica (University of Sheffield)

**Abstract format:** Poster

From the 8th century B.C., the settlement of Phoenician groups in Southeast Iberia had a marked effect on the Early Iron Age indigen-ous communities. Ceramics are a powerful tool to document these cross-cultural encounters which are characterized by a sym-metry and hybridization that evolved up to the 6th century B.C. The present study focuses on a local series of hand-made cooking pots that remained largely unchanged over this 200 year period, in spite of the appearance of wheel thrown pottery in both local and intrusive styles.

Macroscopic and petrographic analysis are used to establish the choice and manipulation of raw materials for these cooking ves-sels, as well as the technological choices involved in their forming and firing. We discuss the importance of continuity in the pro-duction and appearance of these handmade cooking pots as a distinct cultural choice among the autochthonous settlements. It is not only ceramic tradition that is emphasised by such conservatism, but also the continuity of culinary practices, both important aspects for the expression of identity in these communities at a time of change.

c. **BETWEEN EAST AND WEST: TYPOLOGY AND FUNCTIONALITY IN CRUSADER CERAMICS**

**Abstract author(s):** Buránszki, Nóra (Castle Headquarters Ltd.)

**Abstract format:** Poster

Even though the crusader states existed only two hundreds years, the interaction of medieval Europe and the Middle East is re-markable in the archaeological contexts. Potteries of the crusader states, especially those coming from the castles have a unique combination of eastern and western tastes. Although the material culture looks as essentially uniform, the vessels of the various castles have similar functions, but in many cases slightly different shapes.

The Syrian – Hungarian Archaeological Mission, as a research program of the Pázmány Péter Catholic University, has been prose-cuting archaeological researches in Margat Castle (Q’alat– al-Marqab, Syria) since 2007. As a result of these extensive fieldwork, a great quantity of pottery has been brought to light in and around the castle and its suburbs.

In addition to traditional typological examinations, the large number of finds also made it possible to observe various manufacturing techniques.

One of the most annoying object types of processed pottery’s sherds is a characterless, unglazed soup bowl. A large number of objects from the Mrgat Castle area is one of the typical object types of the Hospitallers castles, including in the course of the exca-vation of the Acre Castle. In my presentation, I will examine the question of typology and functionality concerning the subject type.

**PERSPECTIVES OF INTERDISCIPLINARY RESEARCH ON EXAMPLE OF STOVE TILES FROM OPONICE CASTLE (SLOVAKIA)**

**Abstract author(s):** Janciová, Barbora (Constantine the Philosopher University Nitra)

**Abstract format:** Poster

The stove tiles are a specific kind of ceramic production. There are some differences between stove tiles and other ceramics, for example in the manufacture, uses, discard, as well as transformation to the archaeological context.

Most stove tiles from Slovakia were found on the castles or manor houses, where the archaeological findings were mixed up with the destruction of stone walls. From a

stratigraphical point of view, the value of archaeological records is limited. Detailed interdisciplinary research can reveal the truth about the life-cycle of these unique findings.

This contribution deals with the tale of gothic and renaissance stove tiles from Oponice Castle (Slovakia). This is the largest col-lection on Slovakia at present and is dated from the end of the 15th to 17th centuries. By studying fragments of these stove tiles we used a combination of petrographic analysis, morphological and technological studies, typochronological classifications, post depositional alternation analysis and spatial distribution in the area of the castle. By doing so, we were able to reconstruct some as-pects of the life-cycle of stove tiles. This interaction between several branches helped us understand economics, trades, contacts as well as the society during the modern times in the southwest part of Slovakia. In this contribution, you can see the possibilities and abilities of modern methods in archaeology on the example of stove tiles from Oponice castle.

d. **BETWEEN TWO ERAS AND TWO CULTURES: MEDIEVAL AND MODERN POTTERY SEQUENCES OF ALBERCON DEL MORO ARCHAEOLOGICAL SITE (GRANADA, SPAIN)**

**Abstract author(s):** Busto-Zapico, Miguel - García-Contreras Ruiz, Guillermo (Universidad de Granada)

**Abstract format:** Poster

Albercón del Moro is a large water reservoir located in the highest part of the Cartuja University Campus located in the northern part of Granada (Spain). This contribution shows the outcome of the analysis of the pottery of this site.

The archaeological excavations carried out so far give extensive chronology of use, which vary throughout the centuries. In the Nasrid Era (perhaps with an earlier phase) a large building was built. The dimensions of this construction, and the type of exhumed materials, point in the line of a singular building, probably a periurban palatine residence. It could even be in relation to the vizier and polygraph Ibn al-Jaṭīb. The dimensions of the water reservoir exceed strictly agricultural needs, giving it a recreational and represent-ative functionality. From the 13th century there is a process of agrarization of the area, which will be consolidated during the Early Modern Period, when only the pool was used but not the building around. Being in the 18th century an area of orchards and recovered in the 19th century as a recreational space.

Through the study of ceramics, we intend to obtain more data on the transformations suffered at the Albercón del Moro. The re-search methodology of this analysis helps to characterize the pottery material from different points of view. These studies have provided data that offers preliminary conclusions on the medieval and post-medieval settlement in this area, northern of the city of Granada. Evolving from a palatine and power environment, to an agricultural and rural landscape.

**EXPLORING THE SZÉKELYFÖLD THROUGH A MULTIDISCIPLINARY APPROACH TO THE PAST**

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Bethard, Jonathan (University of South Florida) - Nyaradi, Zsolt (Haáz Rezső Múzeum) - Zejdlik, Katie (Western Car-olina University)

**Format:** Regular session

The Carpathian Basin has been characterized as a pluralistic region for centuries. Among the numerous groups residing there, Hun-garian-speaking Székely have figured prominently in the region’s history since their arrival to the eastern Carpathian Basin over a millennium ago. In recent years, a more comprehensive history of the Székelyföld has started to emerge through various disciplinary approaches including novel research from historians, archaeologists, biological anthropologists, and human geneticists. These con-tributions have enriched what is known about the Székely people and have helped to embed the region’s history in a broader Euro-pean context. The purpose of this session is to connect scholars from numerous disciplinary perspectives to share research about Székely communities across time, beginning with their arrival to the region during the medieval period. This session aims to explore how traditional and cutting edge interdisciplinary approaches help to create a holistic perspective on a stable culture in a dynamic region of the Carpathian Basin.



1 UNDERSTANDING SZEKELY HISTORY THROUGH COLLABORATIVE ARCHAEOLOGY

**Abstract author(s):** Bethard, Jonathan (University of South Florida) - Zejdlik, Katie (Western Carolina University) - Nyaradi, Zsolt (Haáz Rezső Museum)

**Abstract format:** Oral

Archaeological exploration of the Carpathian basin has a rich history dating back to nineteenth century as numerous amateur antiquarians documented sites throughout the region. Systematic archaeological excavations were initiated in the early twentieth century prior to the First World War and early correspondence between well-known archaeologists such Ferenc László and V. Gordon Childe suggest that the archaeological history region was of keen interest to leading researchers of the day (László 2009). Throughout the twentieth century, archaeological exploration of the Carpathian basin continued, despite the turmoil caused by the Second World War and the Cold War. During the latter half of the twentieth century, archaeological research in the Carpathian Basin continued to shape local knowledge; however, much of this information did not always reach international audiences, including research on Hungarian-speaking Székely populations in eastern Transylvania. In addition, little bioarchaeological research focused on medieval and early modern Székely communities has been investigated outside the region until recently. This presentations in this symposium present recent work on the archaeology of the Székely and provide one model for advancing archaeological exploration of the Carpathian region.

2 MEDIEVAL BURIAL DEMOGRAPHICS AND A SZÉKELY CASE STUDY

**Abstract author(s):** Zejdlik, Katie (Western Carolina University) - Bethard, Jonathan (University of South Florida) - Kulhavy, Kathryn (University of Tennessee) - Nyárádi, Zsolt (Haáz Rezső Museum) - Gonciar, Andre (ArchaeoTek, Canada)

**Abstract format:** Oral

The Papdomb archaeological site denotes the ruins of a multi-phase medieval church in Harghita county, Romania, immediately outside the village of Văleni (Hungarian: Patakfalva) and within the Székelyföld. The cemetery associated with the church was used from the 11th – 17th century and includes pre-Christian burials. Human interment within the walls of the church started in the second half of the 12th century and extended to the early 17th century with most of the burials interred during the 14th and 15th centuries. Individuals buried within the various phases of the church included males and females and ranged in age from perinate to old adult. Individuals were most frequently interred in an extended, supine position with heads to the west and feet to the east. Limited grave offerings have been found and interment within a coffin appears limited to individuals outside the church wall that were interred post-reformation. Analysis of the burial patterns at the site indicate a nearly equal ratio of adult males and females interred near the highly coveted altar space of the church. However, overall, twice the number of males were interred within the church than females. Age does not show a pattern within the church proper though preliminary analysis suggests infants were buried immediately along the outside of church wall. This paper provides an in-depth overview of demographic burial patterning at the Papdomb site within a larger discussion of how the site compares and contrasts to burial demographics from other medieval cemeteries with a focus on rural cemeteries and cemeteries in Eastern Europe.

3 A PIECE OF PERIPHERAL LIFE: EXPLORING THE HISTORY AND LIVED EXPERIENCES OF A LATE MEDIEVAL-EARLY MODERN VILLAGE CEMETERY IN TRANSYLVANIA

**Abstract author(s):** Miller, Chloé (Central European University)

**Abstract format:** Oral

Among Transylvanian fields of crops, there is a grassy knoll near Városfalva (RO: Orășeni) that had hidden the remains of a forgotten cemetery for centuries. Although disturbed over time by agricultural practices and road construction, the site was not systematically excavated until 2016 by an international team as a salvage project. Városfalva is currently and historically mostly populated by the Székely and is on the periphery of a historic-ethnographic region known as Székelyföld. The initial hypothesis of the site—based on its location in relation to the village and local legend—was that the site was a mass grave of rebellious, sixteenth-century soldiers. However, with the exception of the northern portion of the cemetery that has a large, old tree rooted into it, the rest of the remaining site revealed over 50 identified burials containing children and adults. The presence of different age groups and distinct grave cuts quickly debunked the mass grave of soldiers theory. Associated coins and stratigraphy of the site indicate at least four centuries-worth of use (late 15th-mid 19th century) during significant local and regional historical events such as numerous rebellions, the rising popularity of Unitarianism, bouts of famine, and the influx of Greek Catholic Romanians. This presentation will reveal how these events physically and behaviorally impacted the Városfalva community and those exhumed. In order to construct the most holistic and comprehensive perspective of the site and those buried there, the osteological data were compared to the in-field excavation documents, the official site report, and primary and secondary historical sources.

4 INFANTS RAISED AND BURIED: A BIOARCHAEOLOGICAL AND ETHNOGENETIC PERSPECTIVE OF THE EMERGENCE OF INFANT IDENTITY AND PERSONHOOD IN MEDIEVAL TRANSYLVANIA

**Abstract author(s):** Reinman, Lauren (George Mason University) - Bethard, Jonathan (University of South Florida) - Zejdlik, Katie (Western Carolina University) - Klaus, Haagen (George Mason University) - Zsolt, Nyárádi (Haáz Rezső Múzeum) - Gonciar, Andre (ArchaeoTek)

**Abstract format:** Oral

Archaeologists have long assumed that burials of children carry little social information, since they assumed to be social “blank slates” yet to develop identities as fully formed persons. Yet, variation of mortuary patterns, when contextualized with ethnographic and historical evidence, can reveal changing concepts of non-adult identity and personhood as a reflection of ethnogenetic processes. Precisely because of their young ages and nascent or liminal personae, infant and child burials often reflect ascribed identity manipulation from mourners and idealized beliefs of a community. Change in the burial treatment of children and infants can reveal a society’s perception of ascribed or idealized identity of children through the body politic. Furthermore, such changes can reflect active ethnogenetic processes involving identity, the emergence of personhood, and community hybridization. This work focuses on the mortuary context of 49 perinates and infants under the age of 1 year from the Papdomb site located in Văleni, Romania (12th-17th century). The site encompasses the remains of a medieval church and cemetery where 662 burials have been recovered. Here, we synthesize data on age estimation, pathological conditions, body and head position, placement, location, and associated grave goods. Correspondence analysis is used to test correlations between placement and age of individuals. Observations of the placement of infants and perinates portray a variety of different interments, many of which depict full burial rites. Such depictions contrast wider church mandates and reflect local societal belief systems, the emergence of personhood, and an understanding of polyethnic interactions manifesting into transformed cultural settings.

5 FROM CRADLE TO NAVE: JUVENILE BURIALS WITH COPPER HEADBANDS IN A MEDIEVAL TRANSYLVANIAN CHURCH

**Abstract author(s):** Bews, Elizabeth (Independent Scholar) - Zejdlik, Katie (Western Carolina University) - Nyaradi, Zsolt (Haáz Rezső Múzeum - Székelyudvarhely) - Gonciar, Andre (Archaeotek) - Bethard, Jonathan (University of South Florida)

**Abstract format:** Oral

In recent years the bioarchaeology of childhood has become an essential part of anthropological discourse. As individuals who are particularly susceptible to population stressors, children provide unique insight into the lived experience of antiquity. Despite their significance for examining population health as a whole, the role of children and the perception of childhood in ancient times is still not well understood. The medieval church site of Papdomb in the heart of Transylvania, with its high density of child burials, presents an ideal environment in which to examine the social significance of childhood in medieval Hungary. At Papdomb a small number of juvenile individuals were buried with copper headbands; to date, archaeologists have been unable to determine the cultural implications of this mortuary treatment. In order to understand the significance of these burial goods in medieval Hungarian society, this paper will examine the estimated age at death for those juveniles who were buried with headbands as well as their burial placement within the church grounds. This paper will also take one individual as a case study to investigate the possibility of sex-based burial practices. The juvenile in question displayed bilateral clavicular rhomboid fossae and was buried with a headband. The presence of a rhomboid fossa on the left clavicle indicates with 92.2% probability that the individual is male; however, few studies have explored this osteological indicator in non-adult individuals. Given the presence of rhomboid fossae in this juvenile, and its reliability for sex estimation, this case study could shed light on sex-specific mortuary treatment at Papdomb. Overall, this paper will present a framework for understanding the use of headbands as cultural symbolism amongst the juvenile population at Papdomb and, therefore, provide insight into conceptions of childhood death and the social role of children in medieval Hungarian society.

6 POSSIBLE CASE OF JUVENILE RHEUMATOID ARTHRITIS FROM 14TH-15TH CENTURY TRANSYLVANIA

**Abstract author(s):** Verostick, Kirsten (University of South Florida) - Padula, Katherine (Rowan University) - Williams, Devin (SNA International) - Nyaradi, Zsolt (Haáz Rezső) - Gonciar, Andre (Archaeo Tek-Canada) - Bethard, Jonathan (University of South Florida)

**Abstract format:** Oral

Hungarian-speaking Székely communities have resided in the Carpathian Basin for a millennium and recent bioarchaeological projects have enriched what is known about the history of the region. This presentation discusses a paleopathological case study of a young female individual recovered in a medieval Székely village churchyard. Rescue excavations were conducted in 2012 and 2013 in the Székely village of Mugeni (in Hungarian: Bögöz). Nearly two hundred individuals were recovered and this case study focuses on one individual: GR-13. Osteological analysis estimates GR-13 to be a young adult female, between 18-25 years old at time of death. Radiocarbon dating places GR-13 at approximately AD 1300 to 1415. Sometime after burial, a pillar bisected GR-13’s grave during church renovations. Due to the placement of the pillar, only a partially complete skeleton was recovered. Despite a partial recovery, GR-13 displays multiple pathological changes, including erosive porosity, and cystic and subchondral erosive lesions of major joint complexes including the MCP, PIP, MTP, elbow and ankle, but excluding the DIP joint region. Multiple joint diseases were reviewed. The pathologies present in GR-13 are highly consistent with a diagnosis of juvenile rheumatoid arthritis (JRA). The pathological findings are interpreted in the context of medieval notions of care and disability and provide insight into an understudied area of

DIET IN THE SZÉKELYFÖLD: PRELIMINARY DATA FROM RURAL TRANSYLVANIA

**Abstract author(s):** Peschel, Emily (University of Calgary) - Dunn, Tyler (Creighton University) - Nyaradi, Zsolt (Haaz Rezsó Museum) - Gonciar, Andre (ArchaeoTek Canada) - Katzenberg, M. Anne (University of Calgary) - Ambrose, Stanley (University of Illinois, Urbana-Champaign) - Bethard, Jonathan (University of South Florida)

**Abstract format:** Oral

Investigations of the diets of medieval Central Europeans have provided insights into numerous cultural aspects of these societies, such as social stratification and the impacts of social disruptions. This project investigates the diet of Hungarian speaking Székely communities that have resided in the eastern Carpathian Basin of Transylvania for over a millennium. Stable carbon and nitrogen isotope analysis are used to reconstruct the diet of a group of individuals from the village of Bögöz. Almost 200 individuals were excavated from a churchyard burial ground used by the people of Bögöz from the 12th to 19th centuries. This initial investigation into Székely diet utilizes dental tissues of 38 individuals.

Collagen d13C shows an estimated 20.0±6% C4 in the diet, which indicates that most of the dietary protein came from C3-fed animals. Apatite carbon isotopes show a largely C3 plant diet with approximately 30.0±6% of their diet coming from C4 plants, likely millet, a dietary staple in the region since 1500 BCE. The low average d15N (10.7±0.8‰) provides further evidence for a predominantly plant-based diet. There were no significant differences for either d13C or d15N values from person to person, which indicates a homogenous diet across the population. Individuals from the 12th to 14th centuries, however, had significantly lower d15N values than the later periods. Social turmoil from the colonization of and invasions into Transylvania in the 12-13th centuries may have reduced access to meat resources and increased reliance on millet.

DIETARY RECONSTRUCTION OF THE SZÉKELY COMMUNITY OF PAPDOMB

**Abstract author(s):** Trent, Christina (University of South Florida) - Zejdlik, Katie (Western Carolina University) - Nyaradi, Zsolt (Haáz Rezső Múzeum) - Gonciar, Andre (ArchaeoTek-Canada) - Berger, Jacqueline - Tykot, Robert - Bethard, Jonathan (University of South Florida)

**Abstract format:** Oral

The reconstruction of medieval and early modern European dietary practices is of interest to historians and archaeologists. In archaeological contexts, researchers have relied on stable isotope analysis of human and animal tissues to reconstruct dietary practices for many regions across the continent; however, few contributions have investigated populations in the Carpathian Basin, and no published studies have investigated dietary practices of Székely communities.

This presentation presents novel isotopic data derived from bone collagen and bone apatite samples of Székely individuals who resided at the archaeological site of Papdomb. The site of Papdomb is located in rural Transylvania and includes an archaeological footprint of a village church and churchyard that was the final resting place for hundreds of Székely people for many centuries during the medieval and early modern periods (AD 14th – 19th centuries). Bone collagen and apatite were extracted and stable isotopes of carbon and nitrogen were analyzed in a pilot sample of ten individuals in order to better understand broad dietary practices. Both nitrogen and carbon values derived from bone collagen were homogenous across the sample (mean δ15N = 11.2, SD = 1.1; mean δ13C = -18.6, SD = 0.5) and apatite-collagen spacing (mean Ap-Coll Δ13C = 6.2, SD = 1.1) broadly suggests that members of the Papdomb community had a mostly herbivorous diet with small amounts of meat consumption. In addition, possible social stratification related to dietary provisioning was observed, as the isotopic values of a male individual (G10) were well outside the mean range of other individuals and suggest that he may have had more access to various protein sources. Overall, this study provides additional insight into the lives of a rural Székely community and corroborates evidence of social stratification described in numerous historical sources.

9 CHANGING IMPORTANCE OF COINS IN SZÉKELY BURIALS, 11-17TH CENTURY

**Abstract author(s):** Zejdlik, Katie - Puckett, Evan (Western Carolina University) - Nyárádi, Zsolt (Haáz Rezső Museum) - Gonciar, Andre (ArchaeoTek, Canada)

**Abstract format:** Oral

Coins are useful for investigating temporal context, political influences, social interactions, status, and, when in a burial context, mortuary belief systems. One of the most common interpretations of coins in burials stems from ancient Greece, where coins were placed on the eyes of the dead to pay the ferryman Charon to cross the river Styx/Acheron. Coins have also been interpreted as protective symbols, memory tokens, a final tithe, or were simply placed to keep the eyelids weighted closed. They have been found in the deceased’s hand, mouth, or eyes. Coins and their associated green staining have been recovered from burial contexts within the Székely region of Transylvania and date from the 12th to the 17th century. The most common interpretation of coins in these burials follows the Greek tradition of a post-mortem offering but Transylvania has been a highly tumultuous political and religious region suggesting that despite the relative similar burial context of individuals interred with coins, the use and meaning of the coins has changed through time. This paper will review the importance of coins in pan-European burials. Next, it will offer an interpretation of the different Székely coin burials per each individual’s social and temporal context demonstrating the importance of coin burials for understanding each site’s local context and broader regional integration.

NEW UNIPARENTAL LINEAGES REVEALED IN THE MODERN DAY SZÉKELY POPULATION - POSSIBLE GENETIC CONNECTIONS BETWEEN SZÉKELYS AND EARLY HUNGARIANS

**Abstract author(s):** Székely, Orsolya - Szeifert, Bea - Gerber, Dániel (Department of Genetics, ELTE Eötvös Loránd University, Budapest; Research Centre of the Humanities, Institute of Archaeology Laboratory of Archaeogenetics, Budapest) - Máthé, István (Sapientia Hungarian University of Transylvania, Cluj-Napoca, Faculty of Economics, Socio-Human Sciences and Engineering, Department of Bioengineering, Miercurea-Ciuc) - Pamjav, Horolma (Department of Reference Samples Analysis, Institute of Forensic Genetics, Hungarian Institute for Forensic Sciences, Budapest) - Mende, Balázs Gusztáv (Research Centre of the Humanities, Institute of Archaeology Laboratory of Archaeogenetics, Budapest) - Egyed, Balázs (Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Szécsényi-Nagy, Anna (Department of Genetics, ELTE Eötvös Loránd University, Budapest; Research Centre of the Humanities, Institute of Archaeology Laboratory of Archaeogenetics, Budapest)

**Abstract format:** Oral

The origin of the Székelys, a Hungarian speaking minority in Transylvania (Romania) is an unresolved question to this day, and while several theories have been elaborated to answer their origin, neither were supported by concrete evidence. In the last decades molecular genetics joined in the research to describe their genetic make-up and provide data on the origin of Székelys. Preliminary uniparental genetic studies revealed an increased number of Central or Eastern Asian lineages in the Székely population, compared to other Hungarian populations.

Here we provide a population database containing 115 whole mitochondrial genomes newly sequenced and Y chromosome STR profiles of 92 Székely men to make deeper inferences on the origin and population structure of the Székelys. DNA samples were collected from ten villages near the town Székelyudvarhely. Our results indicate a seemingly local uniparental make-up of the population that also indicates limited admixture with neighbouring populations. Phylogenetic analyses confirmed the presumed eastern origin of certain lineages and in some particular cases they can be linked also to ancient DNA data of early Hungarians. The aim of our research is in the future to generate whole genome data to receive much detailed inferences on the origin and connection of Székelys to archaic and modern day Hungarian and Székely populations. This paper was funded by the Hungarian National Research, Development and Innovation Office -FK 127938 project.

a.

THE BIOARCHEOLOGY OF SKELETAL FUNCTIONAL ADAPTATION: UNDERSTANDING HABITUAL ACTIVITY IN THE SZÉKELY

**Abstract author(s):** Dunn, Tyler (Creighton University School of Medicine) - Bethard, Jonathan (University of South Florida) - Zejdlik, Katie (Western Carolina University) - Gonciar, Andre (Archaeotek Canada) - Nyaradi, Zsolt (Haáz Rezső Múzeum)

**Abstract format:** Poster

The Székely people are a Hungarian speaking ethnic group in the western part of the Carpathian Basin, largely living in a region called the Székelyföld. The Székely have occupied this region for over a millennium and have maintained a unique cultural heritage relative to other groups in the Carpathian Basin. The site of Papdom is a modern cemetery site within the Székelyföld which has been used since the middle of the Medieval period. Papdom is the cemetery for the rural village of Patakfalva, which is 5km from the Székely commercial center of Odorheiu Secuiesc and was initially the site of a medieval church. The church was destroyed in an earthquake in the early 19th century but the cemetery for the church continued to be used. The individuals interred at Papdom represent several hundred years of burials of a rural Székely population.

Little is known about the postcranial variation of populations in the Carpathian Basin, much less the Székely. This research aims to describe and contextualize the unique postcranial form of the individuals from Papdom through comparisons to other European Medieval populations and discuss implications for the habitual activities that these Medieval Székely undertook. Estimates of stature and body mass of the Papdom sample indicate that they are among the most size sexually dimorphic in Europe while they are overall small bodied individuals. Measures of bone functional adaptation are also consistent with this trend of robust males in an overall smaller population. This offers some indication that this population practiced sexual divisions of labor and activity. This presentation will explore this variation and discuss its bioarcheological implications.

b.

DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS (DISH) IN A RURAL SZÉKELY VILLAGE: AN OSTEOBIOGRAPHY

**Abstract author(s):** Trent, Christina (University of South Florida) - Peschel, Emily (University of Calgary) - Nyaradi, Zsolt (Haáz Rezső Múzeum) - Gonciar, Andre (ArchaeoTek-Canada) - Bethard, Jonathan (University of South Florida)

**Abstract format:** Poster

Paleopathological analyses of human skeletal remains can provide complimentary lines of evidence to historical sources describing health and suffering in the medieval European world. Despite a rich paleopathological literature focused on medieval European communities, few studies have investigated rural communities in the Carpathian Basin. This presentation presents an osteobiography of a Székely man with a marked pathological condition which affected his vertebral column. Diffuse idiopathic skeletal hyperostosis (DISH) is an arthritic spinal condition characterized by the calcification of ligaments and tendons surrounding the spinal column and vertebrae. Though the etiological origin of DISH is unclear, it has been linked to both diabetes and obesity and is hypothesized by some scholars to indicate an affluent social status. Moreover, it is more common in males than in females and has been described



in several case studies from medieval European archaeological contexts. Skeletal remains of G278 were recovered from inside the Reform Church of a rural Székely community (In Romanian: Mugeni; in Hungarian: Bögöz) and the vertebral column presented skeletal changes diagnostic of DISH. This presentation will provide a contextualized analysis of DISH in G278, which may provide some insight into his life in the community.

c. **DIFFERENTIAL DIAGNOSIS AND THE HEALTH IMPLICATIONS OF CALCIFIED NODULES FROM A MEDIEVAL SZÉKELY WOMAN IN TRANSYLVANIA**

**Abstract author(s):** Miller, Heidi - Lammie, Jean Louise - Dowdy, Liotta (University of South Florida) - Nyárádi, Zsolt (Haáz Rezső Múzeum) - Gonciar, Andre (ArcheoTek Canada) - Bethard, Jonathan (University of South Florida)

**Abstract format:** Poster

Two unknown calcified objects were recovered with the well-preserved and nearly complete skeletal remains excavated from the cemetery associated with the Reformed Church in the Transylvanian Székely village of Mugeni (In Hungarian: Bögöz), Romania in June 2012 by the Haáz Rezső Múzeum. The two objects, measuring 25.55 x 18.23 mm and 17.62 x 16.38 mm, were found with the skeletal remains of a probable female approximately 25-35 years old at the time of death. Multiple analyses, including X-Ray, SEM, EDS, CT scanning, and gross morphological observation, were utilized to differentially diagnose the two objects and assess pathological conditions with calcifications as a common sign. Soft tissue calcification is a common process in a wide variety of disease states but, while relatively common in modern contexts, identification remains rare in paleopathological literature. In this poster, we present the results of the differential diagnosis of the two calcified objects and discuss the implications this diagnosis may have had on the health of a young woman in medieval Transylvania.

d. **GLENOID RETROVERSION IN MEDIEVAL TRANSYLVANIA: A CASE STUDY FROM THE PAPDOMB SITE**

**Abstract author(s):** Passalacqua, Nicholas (Western Carolina University) - Bethard, Jonathan (University of South Florida) - Zejdlík, Katie (Western Carolina University) - Gonciar, Andre (ArcheoTek, Canada LLC) - Nyaradi, Zsolt (Haáz Rezső Múzeum)

**Abstract format:** Poster

Until recently, bilateral retroversion of the glenoid cavity received little attention in the paleopathological literature. The etiology of numerous pathological conditions has been described and criteria for generating differential diagnoses of glenoid retroversion has been reported. To date, no cases from medieval Transylvania have been described and no examples have been utilized to demonstrate how medieval Transylvanians managed their daily activities with pronounced anatomical impairments.

The case presented here is drawn from the Papdomb archaeological site located in present-day Harghita County, Romania. Excavations of the village's collapsed medieval church and adjacent churchyard were initiated in 2014. Excavation has revealed continual use and reuse of the cemetery over the course seven centuries. To date, 574 grave numbers have been assigned to the skeletal remains recovered from the medieval burial context and represent both adult and non-adult individuals.

During laboratory analyses in 2018, a case of glenoid retroversion was documented in a middle-aged male individual. The pelvis and lower extremities of this individual were historically bisected by a church wall but the remaining skeletal remains were in fair condition. While the proximal humeri were not recovered, retroversion of the glenoid cavities was noted bilaterally and both articular surfaces were oriented postero-laterally. The morphology of the scapulae are typical of congenital bilateral dysplasia and have not been described in any other individual from the Papdomb site so far. In this presentation, we describe the morphology of the scapulae in detail and discuss the consequences of this impairment on daily life.

**345 CROSS-DISCIPLINARY APPROACHES IN ARCHAEOMETALLURGY. PART 1**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Saage, Ragnar (University of Tartu) - Neið, Michael (Uppsala University)

**Format:** Session with presentation of 6 slides in 6 minutes

Archaeometallurgy is a multidisciplinary field populated by researchers of varying backgrounds. Some researchers have their background in science or engineering, and focus on scientific analysis of metallurgical samples. Others prefer an experimental approach, trying to reconstruct ancient techniques and technologies through practical work. And some have their background in the humanities or social sciences, trying to understand metal objects and metal-working from a theoretical or cultural history point of view, or fit them into historical narratives. While all these approaches are valuable in themselves, the most useful archaeometallurgical research is often obtained when two or more approaches are combined. This typically requires different specialists to meet and collaborate – i.e. networking among researchers.

In this 6-slides-6-minutes session we welcome case studies on ancient metalworking in a broad sense. We particularly welcome papers that provide examples of cross-disciplinary research, or show how novel methods – analytical or theoretical – can be used in archaeometallurgical studies. Furthermore, we encourage young researchers to present their work.

**ABSTRACTS**

**1 TRACING PAST METALLURGICAL ACTIVITIES: SOME APPLICATIONS OF MICROANALYSIS AND IMAGING COMBINED WITH ELEMENTAL COMPOSITION DETERMINATIONS**

**Abstract author(s):** Gebremariam, Kidane (The Museum of Archaeology, University of Stavanger)

**Abstract format:** Oral

The determinations of the chemical compositions and structures of archaeometallurgical materials are essential for better understanding of the raw materials and the past technologies employed to produce them. Metallic materials standing alone or applied on supports, vitrified ceramic objects, clayish materials that look like crucible fragments or others related to supposedly metallurgical activities, slags, slag-like objects, etc., are among the archaeological finds recovered during archaeological excavations. Identification of the actual types of these metals and ceramic materials, the purposes they were used for, how they were produced, their current conservation state, among others, can be difficult to figure out with visual examinations alone. There are an array of analytical methodologies that can be applied for the elemental determination of the surfaces of these materials in a rapid, cost-effective and non-destructive manner, respecting the integrity of the archaeological materials. However, these methods, though very helpful in composition characterizations, they often do not directly reflect the composition of the bulk material that is not affected by surface depositions, corrosions, and weathering over extended period. Microstructural information could not be acquired either with these approaches. As a result, the elemental determinations need to be complemented by the microanalyses that combine imaging at very high magnifications using optical\electron microscopy with X-ray or molecular spectroscopic investigations of the diverse grains and microstructures. In this presentation, some examples of analyses of metallic materials, vitrified ceramics, crucible fragments, slags, coins, gildings, etc. will be given. The characterization of the compositions and structures of these materials to support archaeological interpretations, documentation of the objects and their conservation states will be highlighted along with the necessity to combine diverse imaging methodologies with spectroscopic and mineralogical analyses counterparts. The challenges, encountered in such examinations and how some of them can be tackled, will also be pointed out.

**2 ALLOY AND MICROSTRUCTURE OF ISLAMIC CU-BASED ARTEFACTS FROM ALBALAT (ROMANGORDO, SPAIN)**

**Abstract author(s):** Peters, Manuel J.H. (Department of Applied Science and Technology, Politecnico di Torino; Department of History, Universidade de Évora, Portugal; HERCULES Laboratory, Universidade de Évora) - Bottaini, Carlo - Schiavon, Nick (HERCULES Laboratory, Universidade de Évora) - Mirão, José (HERCULES Laboratory, Universidade de Évora; Department of Geosciences, Universidade de Évora) - Gilotte, Sophie (Centre National de la Recherche Scientifique) - Grassini, Sabrina - Angelini, Emma (Department of Applied Science and Technology, Politecnico di Torino)

**Abstract format:** Oral

This research investigates a selection of metal artefacts coming from the Islamic site of Albalat (Southwest Spain), which was occupied from the 10th to the 12th century AD, when it was destroyed during the Reconquista of Iberia by Christian troops.

Eight copper-based metal objects from previous excavation campaigns were selected. The alloy components and microstructures were investigated by Scanning Electron Microscopy with Energy Dispersive X-ray spectroscopy (SEM+EDS), micro-XRF, and optical microscopy (OM). Preliminary results show main alloy components such as copper, tin, and zinc, sometimes with clear evidence for dezincification, and with evident globular lead inclusions in some samples. Additionally, the degradation process following the grain boundaries could be observed.

The results provide an insight into Islamic metal manufacturing techniques in the Iberian Peninsula in the 12th century AD, while at the same time providing additional data on degradation processes that could be helpful for developing a correct preservation strategy for the archaeological artefacts.

**3 LIFE HACKS FROM THE ROMAN IRON AGE: AN INVESTIGATION OF A SOCKETED IRON AXE**

**Abstract author(s):** Saage, Ragnar (University of Tartu) - Kiilmann, Karmo (University of Tartu, Viljandi Culture Academy)

**Abstract format:** Oral

Depending on the research questions past metalworking can be studied from many angles. We combined metallographical analyses with experimental forging to understand the manufacturing technique of a socketed iron axe from Estonia. The axe was found from the largest deposit of iron tools and weapons from Kohtla-Vanaküla in Estonia and is dated to the Roman Iron Age (50–450 CE). The metallographical analysis aided us to answer the questions: how and from what it was made? However, the experimental forging helps to understand the thought process of the past smith and see why it was made like that. The metallographical investigation revealed quite a complex forging pattern for a seemingly simple object. The experimental forging showed that the choice of materials and the way it was put together was very well optimised. Several conclusions can be drawn from the investigation, among which the most important one is that there were occasions when the use of slag-rich bloomery iron was better suited for some parts of the axe than a refined bar.



4 **ARCHEOMETALLURGICAL ANALYSIS OF MEDIEVAL IRON OBJECTS FROM SIGTUNA AND LAPPHYTTAN, SWEDEN**

**Abstract author(s):** Helén, Andreas - Pettersson, Andreas - Eliasson, Anders (Dept. of Material Science and Engineering, Royal Institute of Technology) - Wärmländer, Sebastian (Division of Biophysics, Arrhenius Laboratories, Stockholm University)

**Abstract format:** Oral

The oldest method to produce iron in Sweden and elsewhere was via the bloomery furnace, which produced iron with low levels of carbon. Around the Late Middle Ages, the blast furnace was introduced in Sweden. It produced iron with a higher carbon content.

This study examines the microstructure and hardness of several tools and objects originating from archaeological excavations of Medieval Sigtuna and Lapphyttan. The aim is to examine the differences in quality and material properties of iron produced by respectively blast furnaces and bloomery furnaces. Both methods required post-processing of the produced iron, i.e. decarburization for blast furnaces and carburization for bloomeries. The results show that some of the studied items must have been produced from blast furnace iron, due to their material composition and structure. These items showed overall better material quality and contained less slag. The study also involved an investigation of medieval scissors made from carburized bloomery furnace iron. Here, one specific aim was to find out if the different sections of the shears had different properties, possibly correlating with the functions of the different parts of the shears.

5 **PREHISTORIC COPPER TECHNOLOGY IN ITALY: TOWARDS A NEW MODEL**

**Abstract author(s):** Armigliato, Alessandro (Newcastle University)

**Abstract format:** Oral

The recent questioning of the linear evolution of prehistoric metallurgy (Thornton 2009) has not led to new theories to explain it. Building on the latest research on the subject (Dolfini 2013; Roberts 2008; Bourgarit 2007), this research will combine cutting-edge materials science (Scanning Electron Microscopy with X-ray microanalysis and XRF elemental analysis), experimental archaeology, and a reappraisal of the social theory of technological change to develop a new model for the emergence of copper and bronze technology grounded in a tight regional sequence. Late Neolithic to Late Bronze Age (c.4500-1000 BC) metallurgical residues (i.e. slags, crucibles, prills) from North-Central Italy (excluding the Alps, already widely studied) will be examined to understand 1) the material and social conditions in which early smiths operated; 2) what technological choices they favoured, and how these changed from late 5th to late 2nd millennia BC; 3) the complex dynamics of technology transfer in a prehistoric context. The research will be a significant step towards a new model explaining the emergence of metallurgy in the Old World.

6 **COPPER, NOMADS AND EARLY STATES- THE PROVENANCE STUDIES AND THE POLITICAL RELATIONS IN THE 4TH MILLENNIUM NEAR EAST**

**Abstract author(s):** Czarnowicz, Marcin (Uniwersytet Jagiellonski w Krakowie)

**Abstract format:** Oral

It was believed that at the end of 4th millennium BC emerging Egyptian state either conquest or colonized the southern part of Southern Levant. The newly formed colony, governed from the Tell es-Sakan located near modern city of Gaza, controlled the area of the Northern Negev and Sephelah. The aim of this action was to exploit the area under the rule and gather valuable goods to fulfill the needs of Egyptian elites. According to scholars of the most value were olive oil and wine.

Such “traditional” way of thinking about the relations between the Egypt and local city-states in Southern Levant stays in sharp contrast with the new data collected during the research conducted at the sites such as Tell el-Farkha in Egypt or Tel Erani in modern Israel. A large number of copper artifacts unearthed at Tell el-Farkha shows that this raw material was of the great importance for the local elites. From the other hand Tel Erani was an exchange place where locals helped the Egyptian newcomers exchanging the food surpluses with copper brought by the nomads from the Sinai. Together with other arguments it allows us to completely change the point of view to the relations in questions.

I will present, during my talk, the outcome of the lead isotope studies showing how the network of suppliers changed during the 4th millennium BC and how it reflects the relations between Egypt and Southern Levant in 4th millennium BC.

7 **METALLURGY IN LATE ANTIQUE ROME: WHO, WHERE, WHAT, WHY**

**Abstract author(s):** Bison, Giulia (University of Leicester)

**Abstract format:** Oral

This contribution will present the research I’m working on for my PhD project at the University of Leicester regarding metalworking at Rome between the 5th and 7th centuries AD.

This phenomenon, which in the past has been labelled as the simple result of scavenging activities as a consequence of the “privatisation” of public spaces in the ancient cities, has now begun to be seen as something more organised and probably directed by a superior authority.

Therefore, in order to achieve the most complete reconstruction possible, it is essential to use a cross-disciplinary approach in which archaeometrical analyses can play a key role in explaining the type of technology and materials used in this type of activity.

For this reason, my research will combine the critical review of previous findings in the city and elsewhere with the study of evidence from unpublished structures, whose finds (slag and other kinds of debris and technical ceramics) will be analysed using different archaeometrical techniques and compared with those from other important metallurgical contexts.

The results of this approach will hopefully help to get a bigger picture of ancient metallurgy and shed new light also on the socio-economic history of Late Antique and Early Medieval Rome itself.

In addition to this, I am also planning to combine the analysis of ancient materials with the use of experimental archaeology, especially for what concerns the recycling of materials, a practice that was of considerable importance in Late Antique metallurgy.

8 **TO CLEAN OR NOT TO CLEAN: THAT IS THE RESEARCH QUESTION**

**Abstract author(s):** van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - Beentjes, Tonny - van Bommel, Maarten (University of Amsterdam)

**Abstract format:** Oral

What do we gain by conducting all sorts of interdisciplinary research into archaeological metals? And would it be best to perform analytical studies before or after conservation? The answers to these questions depend ultimately on the type of object, its context, its stability and the techniques used. For archaeological marine precious metals like silver and gold, a research and conservation strategy is being developed in the Netherlands. This so-called AMOR-project is funded by the Dutch Research Council and uses spectacular precious metal finds from a 17th century shipwreck to study the best way to extract information. The results from this process provide all stakeholders in the archaeological process with more background information to aid decision-making, eventually leading to implementing best practises. It is a challenge to embed this strategy into the daily practice of all people involved, due to for example time and/or financial restrictions. This presentation will highlight multiple scenarios and give tips and tricks on how to integrate research and gain valuable information from archaeological metals.

350 **SUSTAINABILITY, UNSUSTAINABILITY AND OPPORTUNITY FOR ARCHAEOLOGICAL DATA**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Wright, Holly - Richards, Julian (University of York) - Ronzino, Paola - Niccolucci, Franco (PIN - University of Florence)

**Format:** Regular session

The rise of digital data in archaeology has created a sustainability crisis requiring urgent action, while also creating opportunities. The majority of archaeological interventions are non-repeatable, and the careful recording carried out to document the resource becomes primary data. As this data is increasingly undertaken using digital methods and tools, archaeological data is often born digital, and with no paper surrogates for the primary record. Archaeological researchers are creative and innovative in their methodologies; adopting, adapting and developing novel techniques and approaches, requiring stewardship of a far greater variety of data formats than other cultural and scientific domains, along with more complex understandings of data re-use. This combination of factors, along with the challenges created by development-led archaeology and a research environment focused on project-by-project funding models, makes moving to a sustainable model even more challenging.

At the same time, work around stewardship and management of archaeological data has contributed to the creation of persistent resources, including an increase in the availability of open access to ‘grey literature’, and data from diverse providers has been made interoperable and cross-searchable across national boundaries. Continued effort to make archaeological data open, persistent and sustainable are urgently needed, and archaeologists must work together to raise awareness and take action. The ARIANDEplus infrastructure (<https://ariadne-infrastructure.eu/>) and Saving European Archaeology from the Digital Dark Age (COST Action SEADDA, <https://seadda.eu/>), invites papers discussing the sustainability of archaeological data, exemplars of open data and data re-use, and technologies and initiatives that promote interoperability and persistent resources. This session also welcomes papers discussing challenges associated with the sustainability of archaeological data, to promote better understanding of how we may work together as a community to address them.

**ABSTRACTS**

1 **DIGGING DIGITAL IN EPHEOS – CHANCES AND CHALLENGES OF A LONG-TERM PROJECT**

**Abstract author(s):** Schwaiger, Helmut - Burkhart, Karl (Austrian Archaeological Institute)

**Abstract format:** Oral

Since 125 years archaeological research takes place at the site of ancient Ephesos. In this period a lot of data has been generated and published. As methods, possibilities and technology have been progressing, also the variety of data has significantly increased.

Although usually different excavation projects are conducted within a certain time period a long-term project like Ephesos bears the opportunity to develop strategies of an efficient life cycle of research data. The interdisciplinary approach offers a wide variety of research fields which is both, fruitful and challenging. Different groups of scientists produce data which have some elements in common but on the other hand their nature differ a lot when looking closer. The workflow has shown that a proper data management plan with strict routines are inevitable in order to avoid a ‘Babylonian language confusion’. In order to provide data exchange with

other research groups outside the Ephesian project a data standardization has to be developed. With such an – sometimes challenging – effort the interoperability and re-use of research data shall be ensured. At the same time the integration of the results of the institute’s work in international frameworks has shown that certain challenges have to be solved.

The paper will present the status quo of an ongoing process. Solutions have to be constantly re-evaluated and their implementation in the international research data infrastructure is highly needed. Once lifted treasures should not remain reburied due to a lack of missing data curation.

2 SUSTAINABLE ARCHAEOLOGICAL DATA IN NORWAY

**Abstract author(s):** Uleberg, Espen - Matsumoto, Mieko (Museum of Cultural History, University of Oslo) - Ore, Christian-Emil (University of Oslo) - Kile-Vesik, Jakob (Museum of Cultural History, University of Oslo)

**Abstract format:** Oral

MUSIT (MuseumIT) is a shared infrastructure for the Norwegian university museums. Artefact metadata are stored in a database used for cataloguing and collection curation. By 2020, close to 1.5 million of these artefact entries are published online at unimus.no.

As part of the MUSIT cooperation, the museums decided in 2011 to use a common solution for excavation documentation – the Swedish Intrasis (intrasis.com). The result is more than 1200 such projects. The e-infrastructure project ADED (Archaeological Digital Excavation Documentation) will migrate these to one system allowing simultaneous map-based and text-based queries. The new system will be based on PostgreSQL, and ensure that the data will be more sustainable. As part of this migration process the excavation data will be mapped to CIDOC CRMarcheo which will ease the integration with other linked data portals for archaeological in Scandinavia and on a general international level. The MUSIT cooperation at the University of Oslo will be responsible for curating the data after the project period.

The Museum of Cultural History publish excavation reports and other of its publications at the Research Archive at the University of Oslo (duo.uio.no). Excavation and artefact photos are stored in the MUSIT photo database and are published at unimus.no/foto, most of them with a CC 4.0 BY-SA license. The museum is creating more 3D-documentation of artefacts and in the field. In case of photogrammetry, files and models are stored in the MUSIT database. The files from lightscanning are stored in standard formats and as raw files at the university servers.

The museum is this way controlling the documentation process from data acquisition to long time, sustainable data storage. There are challenges connected to archaeological interventions conducted where the information pipeline from counties to museums are not always well defined, but this will also addressed by the ADED project.

3 DIGITAL ARCHAEOLOGICAL DATA IN THE WILD WEST: THE CHALLENGE OF PRACTICING RESPONSIBLE DIGITAL DATA ARCHIVING AND ACCESS IN NORTH AMERICA

**Abstract author(s):** Fernandez, Rachel (Center for Digital Antiquity)

**Abstract format:** Oral

Archaeology in the United States is managed by a variety of Federal, State, and Tribal agencies, universities, and private sector organizations. The decentralized nature of North American archaeology results in a lack of standard requirements for digital data documentation, accessibility, curation, and preservation. In contrast, European Union initiatives, such as Europeana, SEADDA, and ARIADNEplus provide useful examples of the advantages of implementing coordinated approaches to the responsible stewardship and management of archaeological data. Along these lines, the Center for Digital Antiquity at Arizona State University has developed a robust infrastructure that supports open access, reproducible science, and synthetic research through their domain repository, the Digital Archaeological Record (tDAR). Using case studies of projects that utilize tDAR for their archival needs, I discuss the advantages and pitfalls of archiving digital archaeological data in the context of North American archaeology, while looking towards potential collaboration and learning opportunities from our European colleagues.

4 CHALLENGES OF MAKING COLLECTIONS ACCESSIBLE. THE CENIEH COLLECTIONS’ SYSTEM

**Abstract author(s):** Rios-Garaizar, Joseba - Rodríguez-Méndez, Jesus - Calvo, Cecilia (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH) - Cuesta, Gonzálo (Universidad de Burgos)

**Abstract format:** Oral

The Centro Nacional de Investigación sobre la Evolución Humana (CENIEH) has had, since its foundation in 2009, the mission of curating and giving access to archaeological collections, particularly those recovered in the UNESCO site of Atapuerca (Burgos, Spain). In 2019 the CENIEH became officially the depository of Atapuerca collections in collaboration with the Museo de Burgos, Museo de Evolución Humana and Junta de Castilla y León. In this time huge efforts have been made not to improve the deposits and the facilities, but also to establish a framework for the digital archiving of the collections and to think how these collections will be accessible for researchers and public in the future. A dedicated software for managing the different collections has been developed. This includes not only the archeo-paleontological collections, but also reference collections as the COAC (Colección de Anatomía Comparada), Litho (Lithotheque), CET (Colección Experimental de Traceología), and Colección de Referencia de Antropología Dental. Also, since January 2019, the CENIEH is part of the AriadnePlus Consortium. The role of the CENIEH is to provide access to the huge

amount of digital information stored and generated by the CENIEH. Different types of data (digital collections, document repositories, raw data, reports) are susceptible to being stored, managed and shared. This action requires a reflexion about how to store this data and how can we make it persistent, accessible and valuable for different kinds of audiences (researchers, general public) without compromising the data itself, the ongoing research and the integrity of the archeological sites of provenance.

5 BEST PRACTICE IN FIELDWALKING DOCUMENTATION: FORMATION OF AN EAA COMMUNITY

**Abstract author(s):** van Leusen, Martijn (Groningen Institute of Archaeology)

**Abstract format:** Oral

For at least the past 25 years archaeologists working around the Mediterranean have stressed, to little avail, the enormous importance - for heritage management and scientific purposes - of being able to merge the hundreds, if not thousands, of fieldwalking datasets generated since the 1950s (Barker & Mattingly eds., 1999-2000). But attempts to analyze multiple fieldwalking datasets (e.g., Alcock & Cherry eds., 2004; Launaro 2011) have so far failed to go beyond an uninformative ‘least common denominator’ approach. More-over, the data of most fieldwalking surveys, and the metadata for nearly all of them, remain unpublished or inaccessible.

However, in recent years we have seen progress on four fronts: survey archaeologists themselves, in bi-annual meetings, are working towards agreement on good field and documentation practice; the FASTI Online Survey project is now actively promoting the submission of legacy survey datasets for online archiving and publication; a Dutch-UK-Italian research team is test-driving a merged survey database for the area around Rome (see paper by Attema in this session); and proposals have been prepared for a field survey extension to the CIDOC Conceptual Reference Model, an international standard for information exchange (De Haas and Van Leusen, forthcoming).

Following a review of the status quo, it will be argued that standardisation of survey documentation practices should now be our first goal, along with a definition and justification of best practice in modern, systematic fieldwalking survey. Having the political and organisational weight of the EAA, as the largest gathering of professional archaeologists in Europe, behind this initiative is crucial; the formation of an EAA community for this purpose will be announced.

6 AND EVERY FAIR FROM FAIR SOMETIME DECLINES? TRACKING THE RISE OF PARADATA TO INCREASE DATA SUSTAINABILITY

**Abstract author(s):** Sköld, Olle - Borjesson, Lisa - Huvila, Isto (Uppsala University)

**Abstract format:** Oral

Large-scale initiatives for archaeological data sharing (e.g. ARIADNE, SEADDA) and the many developing national and institutional data repositories and archives provide unprecedented access to archaeological research data. Access however does not equal impact. Multidisciplinary studies of data reuse (Pasquetto, Borgman & Wofford, 2019) show that infrastructures for data sharing become widely useful when deposited and archived research data are coupled with rich ‘paradata’—contextual information detailing the processes of data production and repository curation (Faniel, Frank & Yakel, 2019). How to identify, document, and communicate paradata of purposeful quantities and qualities therefore makes up a burgeoning area of research in archaeological information science that requires committed inquiry into the practical work of archaeologists and other researchers heading for the archaeological data.

This presentation reports the initial results from a multi-national interview study of archaeologists with repeated experience of publishing data in state-of-the-art data repositories and archives. The presentation investigates archaeologists’ efforts to counter the so called “data creators’ advantage”(Pasquetto, Borgman & Wofford, 2019) by coupling their published research data with paradata with the intent to support data reuse. Particular focus is put on what we call the “publishing threshold”: the liminal space that archaeologists navigate when deciding which paradata to supplement in order to make published data as reusable as possible. Interview data will be complemented by an extensive range of examples illustrating the frontiers of paradata publishing and principal paradata categories in archaeological research.

The study is part of the CApturing Paradata for documenTing data creation and Use for the REsearch of the future (CAPTURE) funded by the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation programme grant agreement No 818210.

7 INTEGRATING MORTUARY DATA IN ARIADNEPLUS

**Abstract author(s):** Aspoeck, Edeltraud (Austrian Academy of Sciences, Austrian Centre for Digital Humanities and Cultural Heritage)

**Abstract format:** Oral

In this presentation I will discuss a subtask of the ARIADNEplus project, the item-level integration of mortuary data made available from ARIADNEplus partners.

The ARIADNEplus project is extending the previous ARIADNE infrastructure by integrating data from a comprehensive selection of archaeological subfields as well as by widening the temporal scope of the collection. In a subtask of integration activities, burial data is integrated on an item level. This means that, rather than integrating the information about datasets so that datasets and

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## RED PILL OR BLUE PILL? USING THE MATRIX TO INVESTIGATE THE FUTURE SUSTAINABILITY OF ARCHAEOLOGICAL DATA

**Abstract author(s):** May, Keith (HE - Historic England; University of South Wales)

**Abstract format:** Oral

Over the last 25 years the archaeological and Heritage sectors among others have concentrated on how the digital data created and stored on computers can be preserved to the same degree that physical museum objects can be kept for the benefit of others. This interest in digital preservation has been especially strong in the archaeological world where excavation data sets are being increasingly gathered as "born digital" data, using the latest computer technologies, i.e. data created on, and only preservable on a computer. This focus has helped address the principle concerns about "how do we keep this stuff digitally".

The focus of digital archives and museums is now switching from not just simply providing better access to digital archives. Increasingly questions of sustainability that ask how are users in commercial archaeological units, curatorial organizations and academia, along with other members of the public, going to make best (re)use of this growing body of digital information and data.

Using the particular recording practices and life-cycles of stratigraphic and phasing data from archaeological interventions, the AHRC funded Leadership Fellow project The Matrix (<https://www.researchgate.net/project/The-Matrix-connecting-and-re-using-digital-records-and-archives-of-archaeological-investigations>) is being undertaken to investigate how digital data from archaeological excavations can be made more useful and interesting to a range of users and audiences.

The project has objectives in four main areas of activity

- Digital Standards;
- Heritage Data;
- Stratigraphy Standards;
- Search Tools;

that aim to address two key research questions:

- How can we encourage the sharing, linking and interoperability of archaeological data and information, particularly information derived from the commercial sector in order to maximize public value and enhance the research potential of archaeological data?
- How can we ensure the consistent development, application, encouragement and ultimately enforcement of technical information and data standards and their promotion to others?

a.

## SAVING DATA IN THE CZECH REPUBLIC? WHERE WE ARE AND WHAT TO EXPECT

**Abstract author(s):** Novak, David (Institute of Archaeology of the CAS, Prague) - Lečbychová, Olga (Institute of Archaeology of the CAS, Brno)

**Abstract format:** Poster

The archiving of digital data was until recently a largely overlooked topic in the Czech Republic. The establishment of a specialized archaeological digital infrastructure, the Archaeological Information System of the CR (AIS CR; <http://www.aiscr.cz/>), provided a new impetus in 2016. Overall, this has channelled the flow of data in Czech archaeology but has not yet expanded the spectrum of information that is stored in principle. The scope of the infrastructure is limited to some extent by legal standards, as the obligation to permanently retain the results of field investigations is defined in very vague terms. As a result, most primary data remains unknown, usually on completely substandard storage sites and not backed up. While a substantial part of the documentation is included in the centrally registered excavation reports, it is not available in its best-use raw form. A complete paradigm shift is inevitable unless we are to lose decades of primary results from archaeological research. Poster describes the current situation and presents both the steps that are taken and needed in the future to adequately protect primary data. It is clear that general initiatives such as FAIR Data or EOSC will play an important role throughout the process, changing data policy from the top, as well as international disciplinary projects (SEADDA, ARIADNEplus) that help to set good practice within the community. But implementation will require a proactive approach by individual states and institutions.

## MOBILITY AND POPULATION TRANSFORMATION IN THE MIGRATION PERIOD AND EARLY MIDDLE AGES: CHANGING SOCIETIES AND IDENTITIES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Knipper, Corina (Curt Engelhorn Center Archaeometry, Mannheim) - Vida, Tivadar (ELTE-Eötvös Loránd University, Budapest) - Winger, Daniel (Universität Rostock)

**Format:** Regular session

Europe witnessed multiple population shifts between the decline of the Roman Empire, which are still a focus of archaeological and historical research today. However, changes of the archaeological record can reflect other modes of exchange than the actual movement of people, so that the importance of residential changes of individuals or groups during the Migration Period and Early Middle Ages remain largely unclear. The integration of multiple strains of evidence from the archaeological data as well as strontium isotope and ancient DNA analyses allows working towards models of individual and group movements. It will also lead to a better and more differentiated understanding of the role of residential changes and the interaction between local and newly arriving, foreign groups. Moreover, carbon and nitrogen isotope data provide invaluable information about dietary habits and their alterations over time.

We invite contributions that bring together evidence of material culture, burial customs, local and non-local individuals in cemeteries, genetic implications on kinship structures and population history as well as subsistence strategies. The session aims at evaluating coincidences of changes of these aspects over time. It also invites reflection on the role of human mobility in what is considered the "Migration Period" and its implications regarding a multi-faceted population history. The section has been inspired by the ongoing German-Hungarian project Mobility and Population Transformation in the Carpathian Basin from the 5th to the 7th Century AD: Changing Societies and Identities (PIs: Tivadar Vida and Corina Knipper) and pursues putting its findings into a wider European context.

## ABSTRACTS

1

## NEW ELITES AND THEIR HORSES IN THE MIGRATION PERIOD LITHUANIA – STRANGERS OR LOCALS?

**Abstract author(s):** Kurila, Laurynas - Piličiauskienė, Giedrė - Simčenka, Edvardas - Miliauskienė, Žydrūnė (Vilnius University) - Lidén, Kerstin (Stockholm University)

**Abstract format:** Oral

The Migration period in Lithuania saw rapid change in culture and social organization. New elites emerged, although the model of their formation is yet unclear. Influences from the Sântana de Mureș-Chernyakhov culture, Central, West Europe, and Scandinavia met in the Baltic milieu. These are synchronous with increase of military character and wealth in the cemeteries. Males and females buried with rich non-local grave goods stand out from other burials. Some warriors were accompanied by horses distinguished by their large body size. One can assume that the elites owned horses of exceptional appearance and probably of non-local origin.

In scholarly debates, the question of the origin of the new elites is among the major ones. Researchers suggest that marauding Asian nomads or Germanic warriors had reached present-day Lithuania and probably joined the local communities forming their elites, or that Balt warriors returned after distant military affairs. Two main directions of foreign influences are visible: from the Middle Danube into East Lithuania and via the Sambian peninsula into West and Central Lithuania.

The presentation will discuss the results of the project aimed at testing the hypothesis that immigrants played their role in the social organization of the Balts and the development of horses of the local type. Three regions are studied where the burials of presumably non-locals concentrate: Samogitia, Central, and East Lithuania. The 87Sr/86Sr and 18O isotope analysis is applied for the remains of males and females, both elites and commoners, and horses.

The isotopic data suggest that some individuals had originated from distinct parts of Lithuania or more remote regions. Most of these were elite males, however, several non-local elite females and commoners of both genders were identified, too. The isotopic values of several horses also indicate non-local provenance. The potential migration routes of people and horses will be discussed.

2

## MOBILITY ON AN IRISH MONASTIC ISLAND: THE COMMUNITY OF INISCEALTRA

**Abstract author(s):** Alonzi, Elise (University College Dublin; Arizona State University) - Seaver, Matthew (National Museum of Ireland) - van Acken, David (University College Dublin) - Lynch, Linda (Independent Researcher) - Smyth, Jessica - Daly, J. Stephen (University College Dublin)

**Abstract format:** Oral

In medieval Ireland, monasteries held substantial religious and social power. Monastic life often involved a separation from society that added to the gravitas of this power. The monastery of Inisceiltra, set on an island in Lough Derg, Co. Clare, is located towards the southwestern end of the River Shannon, the great waterway linking some of Ireland's most important monasteries. The community that lived on Inisceiltra from the sixth to thirteenth centuries represents a notable instance of island monasticism, a practice that utilises the physical boundary of water to separate the religious community from mundane life. Crossing the watery boundary between the lay and religious communities would have required mobility, but some individuals may have traveled longer distances



to participate in the monastic community. The physical remains at the site add to the archaeological context of religious practice and include inscribed stones, grave stones, high crosses, three churches, two oratories, and a round tower. In this study, radiogenic strontium isotope values derived from tooth enamel and bone from around eighteen individuals at up to three points in life will be used to estimate the rates of mobility of members of the medieval religious and lay communities buried on Inisceiltra. The human data will be compared to bioavailable radiogenic strontium baselines constructed by analysing modern plants to assess mobility. Results will be compared to rates of mobility from previously investigated Irish medieval monastic and secular sites, and the connection between mobility and factors such as sex and burial location will be assessed. This study will demonstrate the level to which the monastic community on Inisceiltra were connected to both the local lay community and the wider medieval world.

3

### INTEGRATING ARCHAEOLOGY AND STABLE ISOTOPE ANALYSES TO STUDY EARLY MEDIEVAL SOCIETIES IN A BORDER AREA (BASEL, SWITZERLAND)

**Abstract author(s):** Depaermentier, Margaux (University of Basel)

**Abstract format:** Oral

The project Stadt.Geschichte.Basel offers the opportunity to reconsider the early medieval period of Basel (Switzerland) through the integration of interdisciplinary methods in archaeology. This project focuses on late antique and early medieval burial grounds (4th to 8th century AD) distributed on both sides of the river Rhine, which became a border after the collapse of the Roman administration in the third century AD. Because early medieval archaeology is still influenced by traditional paradigms that result from the interpretation of written sources, it mainly focuses on ethnic categorisation of the archaeological record. In this paper, cultural groups are not considered distinct and homogeneous entities in which material culture represents a clear ethnic and identity marker. However, the coexistence of different groups rather leads to communication networks, socio-cultural transfer and diversity. The application of stable strontium and oxygen isotope analyses provides new information and allows to investigate early medieval mobility patterns with a new perspective on different scales – thus questioning prevailing migration narratives. Additionally, nitrogen and carbon isotope analyses enable new insights in dietary habits and subsistence strategies, which are important research gaps for this period. The integration of cultural-historical and natural-scientific methods leads to an innovative assessment of late antique and early medieval cemeteries and societies at Basel.

4

### MOBILITY AND POPULATION TRANSFORMATION IN THE CARPATHIAN BASIN (5TH-7TH CENTURY AD): EVIDENCE FROM ARCHAEOLOGICAL AND STABLE ISOTOPE ANALYSIS

**Abstract author(s):** Knipper, Corina (Curt Engelhorn Center Archaeometry, Mannheim) - Koncz, István (ELTE – Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Ódor, János (Wosinsky Mór Museum, Szekszárd) - Rácz, Zsófia (ELTE – Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Hajdu, Tamás - Szeniczey, Tamás (ELTE – Eötvös Loránd University, Institute of Biology, Budapest; Hungarian Natural History Museum, Budapest) - Pap, Ildikó (Savaria Museum, Szombathely) - Wolff, Katalin (ELTE – Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Mende, Balázs (Research Centre for the Humanities, Institute of Archaeology, Budapest) - Vida, Tivadar (ELTE – Eötvös Loránd University, Institute of Archaeological Sciences, Budapest; Research Centre for the Humanities, Institute of Archaeology, Budapest)

**Abstract format:** Oral

The Carpathian Basin is a key area for historical and archaeological research of the European Migration Period. Written sources convey a complex succession of population groups between the 5th and the 7th century AD, such as the Huns, Avars, Goths, Gepids, and Lombards, as well as representatives of the former Roman-Pannonian and possibly also Byzantine and Slavic populations. At the same time cemeteries with often very richly equipped burials disclose spatial differentiation and changes of the archaeological record over time. However, the association of historical entities and groups of material culture and burial customs is questionable. Ethnic groups were likely dynamic and flexible, and exogenous assignments may rather have referred to historically acting leaders or military units than to complete population groups including women and children. Likewise, changes of the archaeological record may not have been associated with the actual movement of people.

The presentation summarizes the results of an interdisciplinary Hungarian-German research project that investigated the importance of residential changes of individuals or groups based on six cemeteries in the Carpathian Basin. Strontium isotope ratios of tooth enamel indicate high mobility rates among the populations of the 5th and early 6th century. Non-local individuals were not restricted to the supposed founder generations of the sites. Instead, they point to complex processes of community formations and the integration of arriving groups into settled communities. In contrast, isotopically local individuals prevail in the burial communities of the 7th century, indicating much lower mobility rates with only few non-local males or females. In addition, carbon and nitrogen isotope data indicate substantial dietary changes over time with fluctuating contributions of millet and animal-derived foodstuffs. Overall, the isotope data confirm that the Migration Period of the Carpathian Basin was a highly dynamic time with alternating mobility patterns, subsistence strategies and lifestyles.

5

### TACKLING EARLY MEDIEVAL TRANSITIONS USING A HIERARCHICAL AND MULTI-ISOTOPE APPROACH

**Abstract author(s):** Leggett, Samantha (University of Cambridge)

**Abstract format:** Oral

The socio-environmental transitions in the first millennium AD had wide ranging impacts across Europe which have interesting ar-

chaeological and palaeoecological implications. This paper uses published and new multi-tissue, multi-isotope data from across Europe to look at changing resource use and population movement from c. 400-1100 AD. It brings together biomolecular, environmental and burial evidence to highlight cross-cultural interaction at a broad scale, as well as in smaller communities.

Using a statistically hierarchical approach with carbon, nitrogen, oxygen and strontium data allows us to look at complex interactions between subsistence strategies, environment and culture and the spread of peoples and ideas across Europe from the Migration period to the Christianisation of Scandinavia. Changes in burial practices, life history, environmental factors and traditional narratives of migration are incorporated and evaluated by this multi-level, hierarchical approach. This study shows surprising long-distance mobility from Eastern Europe across to Britain and Scandinavia in the first multi-isotope meta-analysis for our period across such a large geographical scale. It will discuss the implications for European population history and how this more integrated methodology allows for better models of human ecology and cross-cultural interaction in the Early Middle Ages.

6

### PRELIMINARY GENOMIC RESULTS FROM THE MIGRATION PERIOD OF THE CARPATHIAN BASIN

**Abstract author(s):** Török, Tibor (Department of Genetics; University of Szeged; Department of Archaeogenetics; Institute of Hungarian Research) - Neparáczki, Endre (Department of Archaeogenetics; Institute of Hungarian Research; Department of Genetics; University of Szeged) - Maróti, Zoltán (Department of Pediatrics and Pediatric Health Center; University of Szeged; Department of Archaeogenetics; Institute of Hungarian Research) - Maár, Kitti (Department of Genetics; University of Szeged) - Balogh, Csilla (Department of Art History; Istanbul Medeniyet University) - Nagy, István (SeqOmics Biotechnology Ltd.; Mórahalom) - Bernert, Zsolt (Department of Anthropology; Hungarian Natural History Museum) - Pálfi, György - Marcsik, Antónia (Department of Biological Anthropology; University of Szeged) - Szenthe, Gergely (Hungarian National Museum)

**Abstract format:** Oral

Conquering Hungarians occupied the Carpathian Basin between 860-905 AD and subsequently organized the Hungarian state. Archaeologists distinguish two types of cemeteries from the 10-11th century period which can be connected to the Conquerors: Small elite cemeteries with richer findings containing jewels, weaponry and characteristic partial horse burials, and large commoner cemeteries with poor findings.

Previous mtDNA and Y-chromosome studies of the elite groups revealed a high proportion east Eurasian lineages, and population level similarity to modern Bashkirs and Volga Tatars, raising the question as to what extent can these findings be generalized to the entire Conqueror population? By now we have identified 187 mitogenomes from 6 commoner cemeteries, and also sequenced entire genomes from 33 selected individuals. These results were compared to that of the elite groups from which we also sequenced 17 whole genomes.

Maternal lineages of the commoner cemeteries showed predominantly European origin. Some of the few Asian lineages were absent from the elite groups thus may have derived from previous Avar immigrants. Population genetic analysis revealed a significant distance between the elite and commoner population, latter were most similar to modern European groups.

Conqueror elite genomes were highly diverse, containing a distinct group, mapping closest to ancient Central Saka and Tien-Shan Hun samples from Kazakhstan on preliminary PCA and MDS plots. Commoner samples mapped in a cloud between modern Hungarians and the Conqueror elite, somewhat overlapping the latter may indicate possible ongoing admixture between previous local residents and immigrants.

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### DETECTING EARLY HUNGARIANS’ MIGRATION FROM THE URAL-REGION TO THE CARPATHIAN BASIN THROUGH GENETIC CONNECTIONS BETWEEN AND WITHIN THEIR BURIAL SITES

**Abstract author(s):** Szeifert, Bea (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Csáky, Veronika (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Gerber, Dániel (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Mende, Balázs (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Türk, Attila (Department of Archaeology, Faculty of Humanities and Social Sciences, Pázmány Péter Catholic University, Budapest; Hungarian Prehistory Researchgroup, Research Centre for the Humanities, Budapest) - Egyed, Balázs (Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Szécsényi-Nagy, Anna (Institute of Archaeology, Research Centre for the Humanities, Budapest)

**Abstract format:** Oral

Around 895 AD new people appeared in the Carpathian Basin: the Hungarians. According to our current knowledge the first relics from archaeological cultures that are most probably connected with the early Hungarians were found in the Central and Southern Urals. The Hungarians migrated westwards from here through the Middle-Volga region and the East-European steppe, until they arrived in the Carpathian Basin.

Medieval anthropological remains (more than 120 burials, 17 burial sites, grouped in 7 populations) from the principal sites of the presumed movement route were analysed by our research team using archaeogenetic methods. The studied populations have diverse geographic origins (Ural region, Volga-Kama region) and represent different time periods (5-14th century AD), but they have archaeological or geographical connection with each other and the early Hungarians in the Carpathian Basin (Hungarian Conquerors). Between many of the examined sites we see archaeological parallels, e.g. typical jewellery or uralic type ceramic. In contrast, at some of the studied sites only a few archaeological findings have been excavated.

We analysed maternal lineages based on whole mitochondrial DNA sequence and paternal relations based on Y-chromosomal information (short tandem repeats, single nucleotide polymorphism). Some observed maternal lineages (e.g. A12a, N1a1a1a1a, T2d1 haplogroups) showed close or direct maternal relations between the tested populations and even connected them to the Hungarian Conquerors in the Carpathian Basin. We observed that archaeological finds also connect these individuals. In the studied populations we identified in different proportions one Y chromosome subhaplogroup (N1a-Z1936), which is associated with modern day Ugric groups and in line with mitochondrial DNA data also links together the studied populations.

Based on these results, the archaeogenetics may in some cases able to fill gaps in archaeological records.

This research was funded by the Árpád dynasty program (IV.2 subproject) and the Thematic Excellence Programme of the NRDl Office.

8 THE ANGLO-SAXON MIGRATION AND FORMATION OF THE EARLY ENGLISH GENE POOL

**Abstract author(s):** Gretzinger, Joscha (Max Planck Institute for the Science of Human History) - Altena, Eveline (Leiden University Medical Center, University of Leiden) - Papac, Luka (Max Planck Institute for the Science of Human History) - Krause, Johannes (Max Planck Institute for the Science of Human History; Faculty of Biosciences, University of Jena) - Sayer, Duncan (School of Forensic and Applied Sciences, University of Central Lancashire) - Schiffels, Stephan (Max Planck Institute for the Science of Human History)

**Abstract format:** Oral

A series of migrations and accompanied cultural changes has formed the peoples of Britain and still represents the foundations of the English national identity. For the most prominent of these, the Anglo-Saxon migration, the traditional view, resting upon historical sources and derived concepts of ethnic and national origins from the 19th century, outlined that the indigenous Romanised British population was forcibly replaced by invading Germanic tribes, starting in the 5th century AD. However, to which extent this historic event coincided with factual immigration that affected the genetic composition of the British population was focus of generations of scientific and social controversy. To better understand this key period, we have so far generated genome-wide sequences from 80 individuals from eight cemeteries in East and South England. We combined this data with previously published genome-wide data to a total dataset of more than 200 ancient British genomes spanning from the Early Bronze Age to the Early Middle Ages, allowing us to investigate shifts and affinities in British fine-scale population structure during this phase of transformation. Here we present two preliminary results: First, we detect a substantial increase in continental Northern European ancestry akin to the extant Danish and Northern German populations during the Early Anglo-Saxon period, replacing approximately 80% of the indigenous British ancestry during that time period. Second, we nevertheless highlight the continuous presence of ancestry identified in Pre-Saxon Iron Age and Roman individuals during the Early and Middle Anglo-Saxon period, originating in the Early British Bronze Age and closely resembling present-day Celtic-speaking populations from Ireland and Scotland. Therefore, our study suggests that the early English population was the outcome of long-term ethnogenetic processes in which the acculturation and assimilation of native Britons into the immigrating Anglo-Saxon society played a key role.

9 CULTURAL TRANSFORMATION IN TRANS-URALS IN THE EARLY MIDDLE AGES: SOME ASPECTS OF THE MAGYAR ORIGINS

**Abstract author(s):** Matveeva, Natalia (Tyumen university)

**Abstract format:** Oral

Currently, the problem of the Magyar genesis is mentioned in connections with the circle of Trans-Urals archaeological cultures locating in the West slope of the Urals. On the other hand, some material and linguistic artifacts from the Eastern slope of the Ural concentrate researchers' interests on the territory of the West Siberia. We should compare Siberian archaeological cultures with the main stages of the Subbotsy horizon which were formed by ancestors of a population that moved on the Danube at the time when the ethnos of the "Magyar" appeared into narrative sources firstly. We should exclude the problem of the Kushnarenkovo culture from priority directions of searching the Magyar origins. In our opinion, these materials belong to an elite culture of Trans-Urals nomads. By the way, we accept the hypothesis of A.V. Komar about the location of the Magyar's ancient homeland in a nomadic contact zone between the Southern Ural and Aral sea regions before the 9th century AD. The perspective area for verification of the concept is West Siberia. The Bakal culture presumably belonged to the half-nomadic population that lived in the forest-steppe region of the Tobol and Ishim rivers. Some of their groups could participate in the process of the Magyar genesis including the ancient Turkic, Samoyedic, and the Ugric tribes, which had been living on the same territory during the 4th-7th centuries AD period. Future studies should be closer to the corporative approach in which analyze graves, ceramics and domestic culture of a medieval Siberian population between each other.

a. DETERMINATION OF AUTOCHTHONOUS INDIVIDUALS USING STABLE 87SR/86SR RATIOS OF AN EARLY MEDIEVAL CEMETERY IN ALTENERDING, BAVARIA, GERMANY

**Abstract author(s):** Toncala, Anita - Trautmann, Bernd - Kropf, Eva - Velte, Maren - Harbeck, Michaela (Bavarian State Collection of Anthropology and Paleoanatomy, Munich, Germany)

**Abstract format:** Poster

The cemetery at Altenerding, was used continuously between the first half of the 5th century until the end of the 7th century AD.

Comprising around 1450 graves, it is one of the largest early medieval necropolises in Bavaria. Its formation dates back to a time of social upheavals: The Roman Empire had withdrawn from the regions north of the Alps and the ethnogenesis of the future Bavarians began. It is thought that the genesis of this tribe included both the romanised local population as well as immigrants from different regions. However, the proportion of these immigrants is controversial. For this purpose strontium isotope analyses were carried out on 39 teeth of individuals from the Altenerding cemetery, dating into the first occupation phase.

The analysis of 87Sr/86Sr-"isotopic fingerprints" is now one of the most common and established methods in archaeological migration and mobility research. However, there are several approaches to define the baselines of local 87Sr/86Sr ratios, e.g. data narrowing based on the distribution of 87Sr/86Sr ratios in the population, determination of cut-off values by different reference samples, or calculation of local 87Sr/86Sr ratio ranges using mixing models. In order to determine the local 87Sr/86Sr ratios for the area of Altenerding, different approaches were tested and evaluated. Therefore, additional 87Sr/86Sr values of a large number of comparative samples from the nearby region were included. The study shows that mixing models based on a few environmental samples do not allow plausible conclusions regarding local 87Sr/86Sr ratios. Alternatively, we argue that the local 87Sr/86Sr ratio range for the protohistoric site of Altenerding is probably best determined by using the Kernel density estimation (KDE). Thereby the local 87Sr/86Sr ratio range contains values between 0.70860 and 0.71100 and the number of immigrants to Altenerding around 500 AD can be determined to a minimum of 36%.

357 CHRISTIANITY AT THE FRONTIERS

**Theme:** 2. From Limes to regions: the archaeology of borders, connections and roads

**Organisers:** Moreau, Dominic (Université de Lille; HALMA-UMR 8164 research centre) - Petcu, Radu (Muzeul de Istorie Națională și Arheologie din Constanța)

**Format:** Regular session

There is an old myth, still recounted in some of the historiography on Late Antiquity, according to which the Roman army was somewhat involved in the spread of Christianity, usually shortly after the conversion of Constantine. Proponents of that position generally rely on two points: 1- the testimony of the Church Fathers, who are constantly insisting on the receptivity of the soldiers to Christianity; 2- the fact that the Roman army promoted the spread of all kinds of oriental cults, which also implies Christianity.

By this logic, we should be able to observe a degree of Christianisation in the provinces of the Empire which would be proportional to their level of militarisation. The "limes" being theoretically the most militarised area in Late Antiquity, it should then be the most Christianised. Should we therefore see evidence of the military outposts as units of Christian propaganda around the Empire?

It is true that most of the episcopal sees of this part of the Roman world were founded in military camps. Compared to the importance of the militarisation of these territories, the episcopal network was, however, very modest even up to the middle/end of the 6th century, so that the contribution of the army to the spread of Christianity does not seem as obvious is sometimes assumed.

In order to propose elements of answers to that research question, presentations on all archaeological of Christianity on the border areas of the Roman Empire are welcome in this session. These papers can focus on new discoveries, as well as on the re-evaluation of material already studied, which dates, for most of it, from the 4th to 7th centuries AD.

This session is the second part of a first one on the same topic, organised in September 2019, at the 24. International Limes Congress (Belgrade/Viminacium, Serbia).

ABSTRACTS

1 CHURCHES IN FORTS OR FORTRESS CHURCHES? THE ROMAN ARMY AND CHRISTIANITY IN THE NORTH AFRICAN LIMITES

**Abstract author(s):** Rushworth, Alan (The Archaeological Practice, Newcastle upon Tyne; School of History, Classics and Archaeology, Newcastle University)

**Abstract format:** Oral

This paper assesses the role of the Roman army as a force for Christianisation in the African diocese during the later Roman empire, principally in the 4th and early 5th centuries.

Firstly it reviews the evidence for Christian buildings in military and other fortified sites in the North African frontier zone. A number of forts that appear to contain churches have been identified by previous research, e.g. Benian – Ala Miliaria, Drah-Souid and Gouea, implying a close association between the army and Christianity there. However detailed scrutiny of the evidence relating to these sites, examining the chronological relationship of the churches to the sites' military occupational phases, and even their identification as forts in the first place, suggests a more complex and nuanced pattern of site development. The epigraphic evidence for the construction of churches by military commanders is also assessed, along with the wider literary and documentary evidence relating to the significance or otherwise of Christianity in the management of relations with tribal communities in the frontier zone. The paper concludes by questioning whether the Roman army in the region was an active agent of Christianisation, arguing instead that its role was generally more passive, and may itself have been influenced by the wider African population's precocious adoption of the faith.



- 2

CONTROLLING AND DOMINATING THE FORTIFIED LANDSCAPE – EARLY CHRISTIAN ARCHITECTURE ALONG THE DANUBIAN LIMES IN SERBIA

**Abstract author(s):** Jeremic, Gordana (Institute of Archaeology Belgrade)

**Abstract format:** Oral

During large-scale rescue archaeological researches in the area of the Danubian valley that belongs to present-day Serbia, for the needs of construction works on two large hydro-energetic systems (Đerdap I and II), a large number of archaeological sites from various prehistoric and historical periods was registered. The focus of this paper are military fortifications along the limes, used throughout the entire Antiquity period (1st/2nd–6th/7th century), which had, in their final phases (generally, in the 6th century), a church built within the ramparts, as the dominant edifice of the fortification. Unfortunately, findings with clear Christian traits – liturgical objects and objects of personal piety, have been registered only on very rare occasions, sometimes in secondary use.

Church buildings belonged mostly to the one-nave type and had the baptismal function, and they represented the key point not only of the fortified landscape, but also the wider area, which remains unknown to us today, since the areas outside of fortifications have rarely been researched, and even then only on small scales, and therefore, we are lacking information on the scope and size of the settlements, their appertaining necropoles, as well as the existence of other Christian cult buildings outside of the defended space.

In this paper, we will attempt to deal with questions regarding the relationship between church buildings and structures within the defended space, especially remains of military architecture. Also, during archaeological researches of the final phases of those fortifications important traces of different craft and secondary metallurgical activities were registered as well, bearing witness of the dominant sustainable and self-oriented economy of their inhabitants, with a prevalently civilian character. Important questions will deal with problems of more precise chronologies of the construction and usage of church buildings, until their final collapse, probably in the beginning of the 7th century.
- 3

THE SPREAD OF ARIANISM IN THE LOWER DANUBE DURING LATE ANTIQUITY: THE CASE OF DACIA RIPENSIS

**Abstract author(s):** Gargano, Ivan (Université de Lille; PIAC - Pontificio Istituto di Archeologia Cristiana)

**Abstract format:** Oral

The spread of the religious doctrine formulated by Arius in the 4th century owes its success in large part to its dissemination in Illyricum. This doctrine was at the centre of violent political-religious struggles and major ecclesiastical controversies in the Balkans, because of the passionate rivalries between the members of the Church hierarchy. This important struggle was also due to the geographical position of the peninsula, which was the border between both political parts of the Empire: on the one hand, the West, dominated by the Niceno-Atanasian position, and, on the other hand, the East, more inclined to Arianism.

This paper proposes to study that phenomenon, both from the archaeological and the historical points of view, through the case of Dacia Ripensis. This late Roman province, which territory stretched between present-day Serbia and Bulgaria, has the particularity of having been the very centre of the Arian crisis, while being less studied little less than the other provinces of the region. For example, it is the province of a most well-known historical figure within the Niceno-Arian controversy: Palladius, bishop of Ratiaria.

If Dacia Ripensis was fully involved in the spread of the Arianism in the 4th century, that Christian religion was still practised there in the 5th and 6th centuries, in its variant developed by Bononus of Naissus. The Ariano-Bonosiac “heresy” was even so deeply rooted in this territory that the Emperor Justinian needed to take a legislative action to prevent its spread. The aim of this presentation will be thus to define the historical framework which has favoured the spread of this doctrine in Dacia Ripensis and to analyse the material remains interpreted as archaeological traces linked to the followers of Arius’ “heresy”.
- 4

CHRISTIANITY AT THE FRONTIERS: THE CASE OF ROMETTA (SICILY)

**Abstract author(s):** Patti, Daniela (University of Enna)

**Abstract format:** Oral

During the Late Antiquity, Christianity changes and expands the boundaries and the perspectives of the sacred: it is evident, for instance, in the “sacralization of the borders” by means of suburban sanctuaries.

The sacred spaces are signs and markers in the perception of the physical, symbolic and cultural spaces: therefore we have to study local contexts through the analysis of all the available sources, according to the perspective of global history of the “Landscape Archaeology”.

In Late Antiquity, Sicily becomes one of the privileged places of religious coexistence in the Ancient Mediterranean: Christianity, Paganism, Judaism coexist and interact creating new forms of coexistence that is also reflected in the processing and in reuse of sacred spaces.

A case in point is that of Rometta, in the south eastern part of Island: last frontier of the Byzantine Empire, place of last, heroic and desperate resistance to Islamic domination in AD 965.

Rometta is the last frontier of Byzantine culture in Sicily is highlighted by archaeological evidences related to the Byzantine Church of Jesus and Mary, once know as “Santa Maria Cerei” but also to the rock churches, one of which with several crosses carved in the rock, probably related to an early Christian community.

- 5

CHRISTIAN SYMBOLS ON LIGHTING DEVICES FROM THE PROVINCE OF SCYTHIA

**Abstract author(s):** Radu, Petcu (DANUBIUS Project, ANR / I-SITE ULNE / Museum of National History and Archeology at Constanta) - Petcu-Levei, Ingrid (Museum of National History and Archeology at Constanta)

**Abstract format:** Oral

Depending on the context in which lighting devices are found, as well as their decoration, it is possible to understand more about their use in liturgical context. Lamps and other lighting devices were important religious objects, because of the sacred character of light, both for the living and the dead, connecting them to faith, for its protective power. Therefore, we know that light was central to some pagan rituals, as offerings in temples or in funerary rites being well known. In Christianity, light has also been symbolically and functionally tied to religious ceremonies. The lighting devices used in churches were considered as owned by the whole community as well as other religious regalia. Moreover, they were destined to attest to the importance of religion within society and were, therefore, fashioned in precious materials. Relying on the research made within the Lille (France)-based DANUBIUS Project (ANR / I-SITE ULNE), this poster intends to analyse that phenomenon from the point of view of the territory of the province of Scythia, in which we can identify two different lighting systems with Christian symbols: the first and most common being the oil lamp made from clay or rarely from bronze ; second, the suspended lighting devices for glass candles.
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CROSS-DISCIPLINARY APPROACHES IN ARCHAEOMETALLURGY. PART 2

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Saage, Ragnar (University of Tartu) - van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Neiß, Michael (Uppsala University) - Jouttijärvi, Arne (Heimdal-archaeometry) - Wärländer, Sebastian (Stockholm University)

**Format:** Regular session

Archaeometallurgy is a multidisciplinary field populated by researchers of varying backgrounds. Some researchers have their background in science or engineering, and focus on scientific analysis of metallurgical samples. Others prefer an experimental approach, trying to reconstruct ancient techniques and technologies through practical work. And some have their background in the humanities or social sciences, trying to understand metal objects and metal-working from a theoretical or cultural history point of view, or fit them into historical narratives. While all these approaches are valuable in themselves, the most useful archaeometallurgical research is often obtained when two or more approaches are combined. This typically requires different specialists to meet and collaborate – i.e. networking among researchers.

In this discussion session we welcome papers on ancient metalworking in a broad sense concerning the temporal and spatial frameworks, yet with focus on methodologies to cross-disciplinary archaeometallurgical research. We particularly welcome papers that can stimulate discussions on how the same research material can be studied from different angles. One can think of ways to make analytical techniques more accessible and comprehensible to non-engineers or how to integrate social perspectives when investigating ancient metalworking.
- 1

TO THE QUESTION OF THE DISPUTED PROBLEMS OF THE HISTORY OF THE BLACK METAL

**Abstract author(s):** Zavyalov, Vladimir - Terekhova, Natalia (Institute of Archaeology Russian Academy of Sciences)

**Abstract format:** Oral

The greatest importance of iron in the history was noted by many thinkers. The interest of researchers in the history of the discovery and development of ferrous metal is quite reasonable. However, a number of problems are still debatable. These are the reasons for the transition from bronze to iron, the role of meteoritic iron in the formation of the iron industry.

There are several hypotheses regarding the reasons for the transition from bronze to iron: “environmental” (reduction of fuel reserves), “economic” (reduction of tin supply), “technological” (discovery of processes to improve the mechanical properties of ferrous metal). Each of these theses raises a number of criticisms. We would like to offer an alternative hypothesis. In our opinion, the decisive factor in the transition from the bronze industry to the iron industry was the discovery and development of methods for producing metallurgical iron (bloomery process). Convincing evidence of the beginning of the production of metallurgical iron could be considered the appearance of large forms objects of ferrous metal. We may give an example famous finds from Anatolia, which date back to the second half of the 3rd millennium BC. Thus, precisely this time can be considered the beginning of the development of ferrous metallurgy.

One of the most interesting problems is the question of meteoritic iron role in the discovery of the method of metallurgical produc-



tion of ferrous metal. A number of researchers believe that meteoritic iron played a certain role in the formation of the iron industry. In our opinion, there is no reason to link the two processes: the processing of meteoritic iron is just a mechanical transformation of the form, while the metallurgical process is a chemical process of substances transformation (ore – metal).

Research was supported by Russian Science Foundation, #19-18-00144.

2 IRON METALLURGY AT METAPONTUM: THE ARCHAEOLOGICAL RESULTS

**Abstract author(s):** Giardino, Claudio - Zappatore, Tiziana - Vagali, Floriana (University of Salento)

**Abstract format:** Oral

Much evidence relating to consistent iron working activities was found at Pantanello in the Chora of Metapontum, an important city in Magna Graecia situated on the gulf of Tarentum.

This consists mainly of smithing slag - some of which are plano-convex slag -, iron ingots and semi-finished and finished iron items. The productive activity at the workshop of Pantanello can be dated from the Late Republican Roman period (2nd – 1st century BC) to the Early Imperial Roman period (1st – 2nd century AD).

Archaeometallurgical investigations were carried out on these finds with the use of metallography.

Based on to this study, Metapontum hosted a lively craft activity linked to the production of iron, perhaps not only intended to meet local needs.

The territory around Metapontum had no iron ore deposits: the metal therefore had to be imported from other areas. In southern Italy there is no iron ore, with the exception of Calabria and Apulia, where it is found in the form of bauxite deposits. During the Roman period, after the senatus consultum that prohibited mining in the Italian Peninsula (end of 2nd century BC), the metals arrived thanks to long distance trade, mostly from the Iberian Peninsula or from the North Alpine mines.

3 IRON SMELTING DEBRIS ON A SMALL LAKE ISLAND: EVIDENCE OF ACTIVITY OR DISPOSAL OF WASTE?

**Abstract author(s):** Strimaitiene, Andra (Department of Archaeology, Lithuanian Institute of History) - Selskienė, Aušra (Center for Physical Sciences and Technology)

**Abstract format:** Oral

Iron slag is a very durable waste product of the process of producing iron. It is assumed that after smelting it is left as refuse. Therefore, in archaeological surveying, slag is used as a reliable indicator of a site for iron production even though all traces of the furnaces vanished long ago. However, although slag can withstand ploughing, much of it is found outside the primary smelting place due to possible factors of reusing, waste management or disturbance.

There are over 230 prehistoric sites with indications of ferrous metallurgy in Lithuania, and about 90% of them are dominated by evidence of iron slag found in hillforts or settlements. The latest research, however, shows that habitation sites aren't the only places where metallurgy-related evidence can be found. A newly discovered site on a small lake island presents a significant, albeit atypical, addition to the existing metallurgy-related records from the Iron Age. New information was acquired during soil sampling and magnetic susceptibility surveys, small-scale excavations, toponymics information, as well as by investigation of elemental composition and microstructure of iron slag. This presentation discusses the data through which it is hard to explain findings unequivocally. Most of them support the likelihood of iron-production on the island, though some refer to secondary waste disposal or relocation due to natural causes rather than by-product left as refuse. Assemblages from the new site prompt us to further examine iron smelting not only from a technological or metallurgical point of view, but also its role in the social and economic environment of local communities.

4 INTERDISCIPLINARY RESEARCH INTO THE IRONWORKING ACTIVITIES OF THE MEDIEVAL HARBOUR AT HOEKE (BELGIUM)

**Abstract author(s):** Biernacka, Paulina - De Clercq, Wim - De Grave, Johan - Dewaele, Stijn - Vanhaecke, Frank (Ghent University)

**Abstract format:** Oral

The study provides the insight into the technology of historical iron production focusing specifically on the remains such as slag, fuel and other debris found during excavations at one of the Medieval outer harbors of Bruges, located at Hoeke. Several analytical and geochemical methods have been applied in order to analyze the material. The macroscopic recognition of slag pointed out that smithing activities took place because of the presence of plano-convex bottom slag and hammerscale. The mineralogical and elemental composition of the slag has been characterized by X-ray Fluorescence and X-ray Diffraction. A metallography analysis has been performed by using a light optical microscopy. Based on the obtained results, the investigated iron slag has been divided into groups according to its composition such as an iron-rich group and silica-rich group. Each type of group was related to a kind of work and represented a different stage in the chaîne opératoire.

Since there is no evidence for iron ore extraction and bloomery on the site, it assumes that iron was imported from abroad. Therefore, a provenance study of iron will be carried out using Inductively Coupled Plasma Mass Spectroscopy (ICP-MS) concentrating mainly on lead isotopic composition.

Additionally, fragments of charge materials such as coal and charcoal have been found within the excavation site and also incorporated as inclusions in iron slag. The biostratigraphy analysis of coal revealed that the most likely source area for this material is from

Northumberland-Durham Coalfield in England (the oldest area of commercial coal mining in Britain). The further study regarding the char(coal) inclusions will be conducted in the near future.

5 METALLURGICAL INVESTIGATIONS OF SWEDISH MEDIEVAL IRON

**Abstract author(s):** Wärmländer, Sebastian (Division of Biophysics, Arrhenius Laboratories, Stockholm University; UCLA/Getty Conservation Programme, Cotsen Institute of Archaeology, UCLA, Los Angeles)

**Abstract format:** Oral

From the Medieval period onwards, Sweden has been one of the major European exporters of steel and iron. While there are some historical records that describe the amount of steel and iron that was traded, much less is known about the quality of the material, or how it was produced. To answer such questions metallurgical analyses are necessary. Here, we have investigated a number of iron objects from the Medieval period up to the 16th century. The studied objects include finished tools, such as knives and scissors, as well as raw materials such as iron bars at varying stages of manufacturing. With this material we are able to address a number of questions, such as the differences between iron produced in blast and bloomery furnaces, the differences between producing knife and scissor blades, and the qualities of the different types of iron bars that were exported to other countries. We are also able to outline a number of important research questions about Swedish metal working that should be studied in the near future.

6 ANALYSIS OF SLAG AND SLAG-LIKE MATERIALS: SOME CASES OF PHYSICO-CHEMICAL CHARACTERIZATIONS FROM RECENT ARCHAEOLOGICAL EXCAVATIONS IN ROGALAND REGION, SOUTH-WEST NORWAY

**Abstract author(s):** Gebremariam, Kidane - Fyllingen, Hilde - Denham, Sean - Bell, Theo - Demuth, Volker (The Museum of Archaeology, University of Stavanger)

**Abstract format:** Oral

Diverse iron slag and slag-like materials from supposedly metallurgical activities were recovered during recent archaeological excavations in the Rogaland region. Few of these materials are from more defined contexts, with supporting structural features and other accompanying materials, for likely metallurgical activities. Whereas many others are sporadically found without supplementary evidences to facilitate archaeological interpretation of the finds and their origins. The investigation into the compositions and microstructures of both types of finds is essential for getting more insight into the likely activities associated with the slag and slag-like materials and the conditions in which they were produced. In addition to being helpful in addressing various questions posed by archaeologists, they are crucial for documentation of the material characteristics. The results of such analyses can aid to reconstruct past technologies in iron smelting and subsequent processing in different periods and regions. Classifying the materials, as those originating from smelting and smithing slags or other slag-like or metallic materials, is not often a straightforward endeavor through visual examinations of the physical attributes alone, unless complemented by physicochemical characterizations. Furthermore, indications of the nature of the raw materials, prediction of the efficiency of the smelting process (whether the metallurgical processes indeed were successful from thermodynamical considerations) and the different activities involved in the metallurgical processes can potentially be deduced through examinations of the compositions and microstructures of the slag materials. In this contribution, certain cases in the investigation of the apparently metallurgical by-products acquired from different contexts are covered. The analytical methods employed for the analyses of the slag, slag-like, bloom-like, corroded metals and vitrified ceramic materials include optical and electron-microscopies, X-ray spectrometry and X-ray microanalysis in order to acquire elemental composition, microstructural and morphological information. The collaborative and multidisciplinary investigations of these metallurgical materials can lead to unified and well-reasoned interpretations.

7 HOW ARCHAEOLOGY SOLVE NUMISMATIC PROBLEMS? THE CASE OF THE HOARD OF PRAGUE GROSCHEN FROM POLAND AND THE MULTIDISCIPLINARY ARCHAEOLOGICAL TOOLS

**Abstract author(s):** Miazga, Beata - Milejski, Paweł (University of Wrocław, Institute of Archaeology)

**Abstract format:** Oral

Studies of the coins are very important to provide our knowledge about the past. Coins are used by man in daily life and therefore give us the significant data about trade, law or even the craft (e.g. mining or metallurgy). The coins are also very helpful in dating the archaeological sites or artefacts. Therefore the investigation of the coins (single find or hoards) should be realized by different specialists on many levels. One of them is numismatic analysis of the objects, the coin identification and the determine of its type, if it is possible. This is very important in social studies. The second is the archaeological research and the recognition of the coin-alloy, significant in the technological studies. The research are often joined with the more advanced analysis made for finds without the well-known archaeological context, e.g. the hoard of the coins found by amateurs of the history (so-called detectorists). These objects often were not documented properly. In this situation the appropriate analytical tools are very useful.

The example of multidisciplinary investigation is the hoard of 1385 Prague groschen accidentally discovered in south-west of Poland in 2016. The coins were deposited in two rather small ceramic pots, what provoked the medial discussion about the same provenance of the groschen and vessels. Therefore the coins and the pots were studied by optical microscope as well as by FT-IR and XRF to identify and compare the corrosion products. The volume of the groschen and capacity of the vessels were also calculated after making the 3D models and proper mathematic calculations. Finally the groschen were investigated by ED-XRF and SEM-EDS

to recognize the silver fineness and confronted the results with the mine-law. During these studies, the problems with the proper conservation, preparation of the coin and silver surface enrichment were also considered.

8 BROTHERS IN ARMS

**Abstract author(s):** Jouttijarvi, Arne (Heimdal-archaeometry)

**Abstract format:** Oral

Analyzes of iron and copper alloys from the excavations in 2014 at the burial site at Nørre Sandegård on Bornholm have provided new information on the use of iron and copper alloys in Germanic Iron Age in Denmark, a period which is otherwise very poorly investigated. The swords from the relatively well-equipped man's graves were made of carbon free iron, and thus of relatively poor quality. On the other hand, three swords, found in graves containing only swords and knives, were more advanced. Two of these were forged in the same unusual way, and the analyzes showed that the iron had to originate from the same place. As the two graves were next to each other, it suggests that there may have been a connection between the two buried. The analyzes also showed that groups of graves, perceived as being expressed for family relations, also represented contacts with different iron producing areas.

Analyzes of jewelry from the women's graves showed, surprisingly, a well-defined alloy tradition and access to pure copper, tin and brass. Identical analyzes showed that the brooches were made as pairs, probably cast from the same crucible of metal. Even if the composition was different, the choice of alloys reflected a deliberate focus on an overall golden expression.

9 NON-INVASIVE ARCHAOMETALLURGICAL TECHNIQUES USED TO THE INVESTIGATIONS OF A BRONZE HOARD BELONGING TO THE LATE BRONZE AGE

**Abstract author(s):** Ciprian, Lazanu (Stefan cel Mare County Museum Vaslui)

**Abstract format:** Oral

In this work we present the results of using non-invasive compositional analysis and imaging techniques, standard X-ray, in order to investigate a bronze hoard consisting of seven objects belonging from Noua Culture, Late Bronze Age. Compositional elements were measured using a portable XRF and the data were processed using a commercial program for electronic, which allowed the identification of 22 elements materials, with error values under 0,30%. Using this techniques we were able to identify that five of the objects from this hoard were casting using the same raw material. Technical values, weight, length, width of the sickles demonstrates that they were cast in the same mould. Imaging techniques give us information regarding crafting processes, any casting errors, and post casting traces. Regarding traces of use, imaging techniques show micro cracks on the blade which could demonstrated that sickels were used in cutting straws or cereals. Non-invasive techniques can provide information about the composition, material distribution, identification of the raw materials and the crafting processes used by the ancient bronze craftsmen.

10 ARCHAOMETALLURGY AND OTHER STRANGE FAIRYTALES

**Abstract author(s):** Roxburgh, Marcus Adrian (Leiden University)

**Abstract format:** Oral

Modern, scientific approaches to the investigation and interpretation of ancient metal objects, are very far removed from the way ancient craft workers though of, and interacted with, their everyday materials. Magic and ritual have long thought to be associated with the act of metal making, from Bronze Age fairy smiths, Norse dwarves, or Medieval saints. The rare excavation of craft workshops have sometimes inferred a close relationship between the objects made there and a 'Cosmological' imaginary world. But what about the artefacts themselves? How far apart are our microscopes, x-rays and isotopes from this imaginary world of the past? Can the chemical analysis of archaeological metals tell us more about human behaviour, beyond the more traditional provenance paradigm and the better establishment of metal groups? Can newly emerging scientific techniques help us think beyond rational secular, social and economic values, to say something more about the creative choices made by ancient metal workers?

11 THE ARCHAOMETALLURGY OF BRONZE AGE CONFLICT

**Abstract author(s):** Dolfini, Andrea (Newcastle University) - Hermann, Raphael (University of Goettingen) - Wang, Quanyu (Shandong University) - Crellin, Rachel (University of Leicester) - Uckelmann, Marion (Durham University)

**Abstract format:** Oral

The paper presents an innovative cross-disciplinary approach to the study of Bronze Age conflict that integrates materials science, metalwork wear analysis and experimental archaeology. The approach, developed from 2013-2018 as part of the 'Bronze Age Combat' project, has allowed the team groundbreaking new insights into the social realities of interpersonal violence in middle and late Bronze Age Europe, focusing on sword fighting practices. The project aimed to understand how early bronze weapons were used, in what kind of combat situations, and with what possible weapon strikes and body motions. To answer these questions, we developed a bespoke methodology that combined two different types of field test with replica swords, spears and shields, the wear analysis of over 100 original Bronze Age swords from Britain and Italy, and the comparative metallurgical analysis of archaeological and replica weapons. We played out over 140 different combat scenarios to create a large reference catalogue of combat marks that could explain the many thousands marks identified on the original Bronze Age weapons by wear analysis. Formal experiments clarified wear formation processes with an unprecedented level of detail, while fluid combat tests based on historical fencing treatises gave us in-

depth understanding of weapon handling, capabilities, and the fighting styles that could have informed their usage. These important research results were validated by metallurgical analysis, which gave us insights into the material properties of both of archaeological and replica weapons and to what extent they compared. The project provides an innovative blueprint for cross-disciplinary research in archaeometallurgy that can be applied to other fields of embodied practice, e.g. craft. It also offers an excellent example of how broadly relevant social problems can be addressed through integrated archaeological, metallurgical and experimental research, generating new knowledge about the human past.

12 TOSS A COIN TO YOUR MILLER: AN INVESTIGATION OF A CURIOUS SET OF 16TH CENTURY CASTING TOOLS FROM TALLINN, ESTONIA

**Abstract author(s):** Saage, Ragnar (University of Tartu) - Wärmländer, Sebastian (Stockholm University)

**Abstract format:** Oral

The collection of curiosities gathered in the 19th century by the town pharmacist Johann Burchard has provided us with a peculiar set of casting moulds and some cast artefacts. These included two stone casting moulds (dated to 1537 CE), several different cast tokens and a metal mould that was made out of leaded gunmetal. These have never been buried under the ground, which complicates their investigation. The metal mould consisted of two interlocking parts, both of which are completely intact. The cast tokens were made from an unusual tin-mercury alloy, which bring up several questions: were the tokens cast in the 16th century or were these cast by Johann Burchard himself just to try out the moulds? Where would a tin-mercury alloy be found and why use it instead of pewter? To answer these questions we combined the archival sources with instrumental data from SEM-EDS analysis of the casting moulds and the finished objects.

a. ARCHEOMETRIC TECHNIQUES APPLIED TO THE STUDY OF PROTOHISTORIC AND ROMAN IRONS AND STEELS SUBJECTED TO INCINERATION

**Abstract author(s):** Martín, Antonio (Universidad Internacional de La Rioja) - Dietz, Christian (University of Tasmania) - Nestares, Eva María - Pérez Largacha, Antonio (Universidad Internacional de La Rioja)

**Abstract format:** Poster

The work presented is about the study of typical microstructures that appear in the core of steel parts incinerated with corpses between the protohistoric and roman peoples. Through its analysis and the reproduction of the thermal and aging process that these pieces underwent, with modern experimental steels, of the same characteristics, in the laboratory, we can deduce data such as the temperatures that were reached in these funeral rites, the cooling speeds of the pyre, if the pieces of steel analyzed

they burned next to the corpse or were deposited a posteriori next to the cinerary urn without suffering exposure to the fire and the thermodynamic processes that operated in the pieces during the rite and that result in these structures. The laboratory reproduction of these microstructures in modern steels consisted of taking samples of the experimental AISI 1005 steel that has similar characteristics as the archeological steels and iron, its low carbon content being essential. The temperature was raised in a Carbolite Resistance Furnace to the austenitic field (1000 ° C) and then cooled to air causing a strong thermal gradient.

364 INTEGRATED METHODOLOGIES FOR THE STUDY OF LIFEWAYS, DIETARY AND OCCUPATIONAL ENVIRONMENTS IN PREHISTORIC AND HISTORICAL PERIODS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Cristiani, Emanuela (Sapienza University of Rome / DANTE - Diet and ANcient TEchnology Laboratory) - Radini, Anita (University of York, Department of Archaeology and Physics) - Zupancich, Andrea (Tel-Aviv University, Department of Archaeology and Near Eastern Cultures)

**Format:** Regular session

The proposed session aims to host talks discussing how inter and cross-methods including, the analysis of skeletal remains, bio-deposits and ancient material culture can be successfully applied to the study of dietary and occupational environments in pre-historical and historical periods. In the last decade, much archaeological attention has been focused on reconstructing ancient lifeways, with a special emphasis on dietary and daily habits, occupational environments and health status. Throughout time and space, the life of ancient humans involved a deep entanglement between people and material culture. Consequently, analyzing ancient lifeways means searching for both direct strands of evidence for human biographies (i.e., skeletal remains as well as other bio-archaeological deposits) as well as indirect evidence of people daily life activities (i.e., material culture and ancient technology).

Recent advances in the field of bio-archeology have proven dental calculus as an important archaeological deposit with high potential to provide novel insights into dietary and non-dietary habits, health conditions as well as occupational environments of past populations. Similarly, the study of ancient tool use, based on the application of quantitative approaches (e.g., 3D modeling, spatial analysis, surface metrology, laser scanning confocal microscopy) in combination with standard use-wear as well as optical and chemical analysis of ancient residues, have provided us with new means for understanding tools' biographies and their involvement in the daily-life of past populations.

This session invites all those interested in the study of ancient lifeways, regardless of geographic boundaries or chronology, to share their results based on cutting-edge inter and cross-disciplinary approaches applied to different archaeological and bio-archaeolog-



ical evidence, to explore new narratives which only the integration of such interdisciplinary methods can provide, and to discuss future avenues in the analysis of human and material culture biographies.

ABSTRACTS

- 1

**SICILY IN TRANSITION: A GLIMPSE INTO REGIME CHANGE THROUGH DENTAL CALCULUS ANALYSIS**

**Abstract author(s):** Mutri, Giuseppina (The Cyprus Institute) - Alexander, Michelle - Carver, Martin (BioArch, Department of Archaeology, University of York) - Molinari, Alessandra (University of Rome 2 Tor Vergata) - Nikita, Efthymia (The Cyprus Institute)

**Abstract format:** Oral

The current paper explores changes in dietary and occupational patterns in Sicily throughout the Byzantine-Arabic-Norman-Swabian transition, which spanned the sixth to thirteenth centuries AD. The data originates from across the island of Sicily and covers both Christian and Muslim cemeteries. Successive transition from the Byzantine (Greek speaking, Christian, 6-8th century) to the Aghlabid (Arabic speaking, Islamic, 9th century), Kalbid (Arabic speaking, Islamic, 10-11th century), Norman (Latin/French speaking, Christian, 11th to 12th century) and, finally, Swabian (Latin/German speaking, Christian, 12th-13th century) regime is examined by means of dental calculus microdebris. Numerous studies have highlighted the potential of such microdebris to elucidate past dietary patterns as many plant parts and by-products (e.g. starches, phytoliths) may get entrapped inside the calculus matrix as it slowly forms in the mouth. In addition, dental calculus is an important reservoir for particles that are accidentally inhaled during daily activities (e.g. pottery dust and minerals). The dental calculus analysis of the material from ancient Sicily forms part of a much broader project exploring regime changes through an integrated analysis of material culture (coins, seals, pottery) and bioarchaeology (plant remains, faunal remains and human remains), employing state of the art scientific procedures (thin sections, organic residues, stable isotopes, ancient DNA) in order to reveal diet, economy, mobility and the way these changed between the sixth and thirteenth centuries. This project has received funding from the European Union's Horizon 2020 research and innovation program (grant agreement No 693600), while the dental calculus analysis has been funded by the European Regional Development Fund and the Republic of Cyprus through the Research and Innovation Foundation (EXCELLENCE/1216/0023).
- 2

**THE MEDICAL PROJECT: EXPLORING MEDICAL REMEDIES IN MEDIEVAL LEPROSARIA THROUGH DENTAL CALCULUS ANALYSIS**

**Abstract author(s):** Fiorin, Elena (DANTE – Diet and Ancient Technology laboratory, Department of Oral and Maxillo Facial Sciences, Sapienza University) - Roberts, Charlotte (Department of Archaeology, Durham University) - Cristiani, Emanuela (DANTE – Diet and Ancient Technology laboratory, Department of Oral and Maxillo Facial Sciences, Sapienza University)

**Abstract format:** Oral

This paper draws on the first results of the MEDICAL project (Horizon 2020 - Marie Skłodowska-Curie Actions Individual Fellowships) based at the Department of Oral and Maxillo Facial Sciences, Sapienza University (Italy) and the Department of Archaeology, Durham University (United Kingdom). Medical treatments given to people affected by leprosy in the past, including specific diets, are generally reported in medical treatises but they have never been analysed objectively in the archaeological record to date. Given the capacity of ancient dental plaque to trap particles of food and other substances ingested or inhaled during one individual's life, along with microfossils of plant species which may be directly linked to medicinal uses, through dental calculus analysis the MEDICAL project investigates diet and medical care given to the people that lived in leprosaria in Northern Europe during the late medieval period (1100-1550 AD). In this paper, preliminary data from the study of individuals buried within the leprosy hospitals of St. Leonard (England) and Saint-Thomas d'Aizier (France) will be presented and discussed.
- 3

**STARCH, PHYTOLITHS, AND DENTAL CALCULUS: PART OF THE TOOLKIT FOR IDENTIFYING DIET**

**Abstract author(s):** Scott Cummings, Linda (PaleoResearch Institute)

**Abstract format:** Oral

For decades, human coprolites have provided invaluable insight into prehistoric diet. Yet, it appears there is more to be learned. When comparing data obtained from coprolites and dental calculus from naturally mummified bodies dating to Early and Late Christian times from Nubia, the coprolites contributed pollen, phytoliths, and macrofloral/faunal remains representing foods consumed. It was, therefore, surprising, to examine dental calculus removed from teeth from the individuals as the coprolites, providing a level of control not usually attainable in archaeological deposits. Recovering and identifying starches in the dental calculus enlarged the record of diet to include yams.

In another study of a 15-year-old boy killed within two weeks of arriving at Jamestown, Virginia, in 1607, starch and phytoliths recovered from a tooth root canal indicate that wheat/cereal grains were part of his diet, presumably at home in England and probably on the ship, and that he had already consumed maize in the New World during his brief life in the colony. He was the first individual killed in a skirmish with the local Indians. His difficult life included an accident at age 8 that injured a tooth, leading to root canal death, impaction, and severe bone erosion. Over the course of the remaining 7 years of his life he accumulated food debris in the root canal. We recovered starches and cut and torn phytoliths, indicating his diet included threshed cereal flour (consumed in England and probably on the ship) and New World maize.

- 4

**ASSESSING THE UTILITY OF LITHOLOGICAL DEBRIS IN ANCIENT HUMAN DENTAL TARTAR**

**Abstract author(s):** Radini, Anita (BioArCh and York Jeol Nanocentre, University of York)

**Abstract format:** Oral

Ancient dental tartar has now widely recognised as a valuable results in the study of ancient diet, in particular for what concerns the deliberate consumption of plant food. A great variety of micro-remains from all kingdoms of life have been retrieved in this deposit proving it useful in the reconstruction of different aspects of ancient ways of life. This paper, for the first time, assess the utility of non-organic remains, of lithological origin, that can be retrieved from dental tartar and presents a way forward in the identification and interpretation of this neglected line of evidence. It will showcase examples from a great variety of temporal and cultural contexts, from Europe, Africa and the Middle East, spanning nearly 4000 years of human history. Potential and limitations of particulate matter of inorganic origin will be assessed, together with the introduction of new directions in its recording and interpretation. It is argued that a better understanding of the lithological micro-debris in ancient dental tartar may provide novel insights into livings conditions and occupations of ancient people.
- 5

**QUANTITATIVE APPROACHES TO CEREAL FOOD TECHNOLOGIES: A STUDY OF NEOLITHIC GRINDING STONES FROM GÖBEKLI TEPE AND THEIR EXPERIMENTAL REPLICAS**

**Abstract author(s):** Dietrich, Laura - Haibt, Max (German Archaeological Institute, Orient Department)

**Abstract format:** Oral

During the 10th and 9th millennia BC, at Göbekli Tepe in southeastern Anatolia hunter-gatherers constructed the first monumental architecture of mankind. Important questions regarding this site concern the way in which small-scale groups joined their forces for the massive construction work, and how they secured their subsistence during the prolonged work at the site. More than 10.000 grinding stones were discovered at Göbekli Tepe, ranging from flat slabs over deep bowls to mortars, pestles and handstones. The current paper will focus on the handstones, which proved to be very informative regarding functional analysis. In order to handle such the unusually high number of finds, functional analysis was conducted in three steps. First, all finds were analyzed by optical examination and tactile investigation. On selected diagnostic artefacts 3D-modeling and topographic analysis of microscopically visible use-wear traces were carried out on a second level. Third, a comparison of the results with experimentally manufactured and used objects was realized. During the experiments, use-wear was related to shapes and to grinding motions as important analytical parameters besides the processed materials. This combined approach allows the quantification of use-wear on active parts on handstones in order to understand processes of use and wear as well as the duration of their use-lives. The large amount of Neolithic handstones with similar wear analyzed allows the development of a new, statistically secured method for the reconstruction of use-lives of handstones.
- 6

**USING MACRO TOOLS FOR DAILY-LIFE ACTIVITIES AT THE LATE MESOLITHIC SITE OF VLASAC (SERBIA): RESULTS FROM QUALITATIVE AND QUANTITATIVE ANALYSES**

**Abstract author(s):** Cristiani, Emanuela (Depart. of Odontostomatology and Maxillo-Facial Sciences; DANTE - Diet and Ancient Technology Laboratory, Sapienza University of Rome) - Zupancich, Andrea (Tel Aviv University; DANTE - Diet and Ancient Technology Laboratory, Sapienza University of Rome) - Boric, Dusan (Columbia University)

**Abstract format:** Oral

In this presentation, we discuss benefits of an integrated approach that uses 3D modeling, surface metrology, GIS, use wear and residue analyses devoted to the interpretation of ancient stone tool use. We discuss the possibility of monitoring changes in surface morphometry using 3D modeling and surface metrology as well as the potential to improve the results obtained by the application of use wear at low and high magnifications. Geomatic analysis of tools' surfaces allows us to objectively quantify patterns of surface-modifications associated with specific activities (e.g., grinding, crushing and pounding) and/or worked materials. Our study focuses on the analysis of experimental macro tools utilized in a variety of activities and substances including vegetal, animal, and mineral materials. Along with the presentation of the results of our dedicated experimental framework, we will provide preliminary data coming from the application of the aforementioned combined approach to archaeological materials. In particular, we will show how the application of such an integrated approach led us to the interpretation of the functional role of macro stone tools in the daily life activities of the late Mesolithic site of Vlasac (Serbia) located in the Danube Gorges of the central Balkans.
- 7

**FOODWAYS OF THE EARLIEST FARMERS IN THE CENTRAL PLAIN OF CHINA**

**Abstract author(s):** Li, Weiya (Leiden University)

**Abstract format:** Oral

The site of Jiahu (9000-7500 BP) represents a complex and highly structured Neolithic society in the central plain of China, which was occupied by the earliest farmers outside of the Yangtze River catchment. The site went through eight excavation seasons since 1983, with 2900 square metres brought to light so far. Three phases of occupation can be identified according to radiocarbon dating as well as material culture features: Phase I (9000-8500 BP), Phase II (8500-8000 BP), and Phase III (8000-7500 BP). Multiple scientific methods have been applied to different categories of material remains unearthed from this site, including pottery, stone tools, plant, animal and human remains. The objective of this paper is twofold. a) to integrate data from the previous studies and our



8 recently conducted research on the Jiahu grinding tools to explore the Neolithic foodways at the site; b) to investigate the influence of food and food-related activities on the Jiahu inhabitants in terms of their health conditions.

## 8 APPROACHING DAILY LIFE AT THE LATE PALEOLITHIC CAMPS

**Abstract author(s):** Sobkowiak-Tabaka, Iwona (Institute of Archeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań) - Diachenko, Aleksandr (Institute of Archaeology, National Academy of Sciences of Ukraine, Kyiv)

**Abstract format:** Oral

The aim of this paper is to develop a systematic approach to daily life at Late Paleolithic camps. The systematic context of our research concerns the following questions commonly asked in respect to the analysis of Paleolithic sites: when, in what season, by whom and for how long were the camps inhabited and what was the nature (function) of the settlement In numerous cases, occurring especially in sandy sediments on the North European Plain, sites are represented by poorly preserved contexts, which in turn require the introduction of spatial statistics (nearest neighbours statistics) into research procedures. Our approach was exemplified by the case study on Federmesser and Swiderian campsites at Lubrza 10, Western Poland. As one of the most important integrative elements of Paleolithic camps, locational analysis of hearths provides information of hearts, activity areas, season of occupation and site duration. Additionally, the function of distinct concentrations and their aggregations was analysed. The research procedure applied made it possible for us to trace both the contribution of individuals to group behaviour and specific individual activities at both camps.

Project 2016/21/B/HS3/04134, financed by National Science Centre, Poland.

## 9 BURNING QUESTIONS ABOUT MESOLITHIC SITES

**Abstract author(s):** Halbrucker, Éva - Fiers, Géraldine (Ghent University) - De Kock, Tim (University of Antwerp) - Vandendriessche, Hans - Cnudde, Veerle - Crombé, Philippe (Ghent University)

**Abstract format:** Oral

Fire has played an important role in human history. It has been part of occupation sites since at least the Middle Palaeolithic. However, little is currently known about the exact impact of fire on lithic artefacts, which are frequently found within prehistoric hearths. Even less is understood about the effect of burning on microscopic wear traces. To address this gap, we conducted several experiments in the framework of an interdisciplinary project at Ghent University combining geologists and archaeologists. Experimentally used replicas of Mesolithic flint artefacts from NW Belgium were burnt both in field and laboratory conditions. Microwear traces were analysed before and after the alteration, and also validated by blind-test. Possible microstructural and geochemical changes in the flints are investigated using micro-CT and thin-section analysis. This is combined with traditional microwear analysis. The first results show that microwear traces are preserved even when the replicas show heavy burning features. The preservation characteristics are connected to temperatures, raw material characteristics, and contact materials. Therefore, to have a more unbiased view on the activities conducted with stone tools, burnt artefacts should be included in the functional analysis of lithic assemblages. This way we can have a more inclusive view on the way of life. This certainly holds for Mesolithic sites as these generally include large proportions of artefacts affected by heating (30-75%).

Our observations are also interpreted on a broader theoretical level. We reflect on the spatial and social organisation of campsites and on the possible causes for the concentrated larger quantities of burnt artefacts on the sites. Were stones deliberately thrown into the fire after use? Could this have been done as a clean-up strategy? Or were they discarded at the same refuse area where heat-dumps were deposited? We will present the insights gained from our experiments to these questions.

## 10 FOODWAYS IN TRANSITION: EVIDENCE FROM ORGANIC RESIDUE ANALYSIS AT THE MIDDLE CHALCOLITHIC SITE OF TEL TSAF

**Abstract author(s):** Chasan, Rivka (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa) - Spiteri, Cynthianne (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhard Karls Universität Tübingen) - Rosenberg, Danny (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa)

**Abstract format:** Oral

Tel Tsaf is a Middle Chalcolithic site (ca. 5,200–4,700 cal. BC) located in the central Jordan Valley, Israel. The site is characterized by extensive mudbrick architecture, evidence of large-scale agriculture production and storage and signs of far reaching trade connections. The site is unique and marks shifts away from the classic Neolithic lifestyle and the first steps in the region toward increasing socio-economic complexity.

Botanic and faunal remains paint a partial picture of the site economy based on agro-pastoralism. This study applies organic residue analysis to link these foodways to the ceramic and stone vessel assemblage. The research incorporates a high-throughput analysis, applying conventional solvent extraction, saponification, and, on select samples, isotopic analysis, in order to characterize the lipids preserved within the ceramic and stone matrix. In total, 99 samples were analyzed from a deep-cut at the site in order to detect subtle shifts between the earlier and later layers of the site occupation.

The lipid yield from pottery was low, although saponification revealed the presence of high amounts of lipids polymerized to the

ceramic matrix. Results based on the fatty acid profile indicate a mixed utilization of pottery for both animal and plant products. Further, organic residue analysis was used to identify cooking vessels as well as the potential application of vessel sealants. The lipid profiles also suggest early use of beeswax in the region. Combined, these results elucidate previously unidentified components of the site economy, widening the discussion on this transitional period.

## 11 UTILISING ORGANIC RESIDUE ANALYSIS AND STABLE ISOTOPE PROXIES TO DECIPHER DIETARY PATTERNS OF HILLFORT ASSEMBLAGES IN MEDIEVAL EUROPE

**Abstract author(s):** Brown, Sophie (University of Bristol) - Rusteikyte, Aukse (Vilnius University) - Tabaka, Arkadiusz (Ostrów Lednicki, Museum of the First Piasts, Lednica) - Klimowicz, Patrycja - Krysztofiak, Teresa - Miciak, Magda (Giecz, Branch of Museum of the First Piasts) - Evershed, Richard (University of Bristol)

**Abstract format:** Oral

Due to the inherent ability of lipids to be preserved in ceramic matrices, organic residue analysis of excavated cooking vessels has allowed for the inference of natural resource exploitation employed by inhabitants at a given site, thus initiating an evaluation of settlement dietary practices. This well-established biomolecular approach has been applied to several Medieval hillfort sites of Eastern Europe connected to emerging entities of power: initially in the Wielkopolska region of Poland, attributed to the early dynasty of the Piasts; and recent work extending to Lithuanian territory, for the later ducal residency of Vilnius Lower Castle and associated hillfort assemblages.

By performing GC-FID, GC-MS, and GC-C-IRMS analyses on sherd sub-samples, organic biomarkers of various animal origin have been identified. With lipid extracts denoting an abundance of degraded animal fat signatures (i.e. palmitic and stearic acids), compound-specific isotope work has allowed for further differentiation regarding fat source. Due to varying metabolic and biosynthetic pathways for fatty acid production in different organisms, it is possible to distinguish between dairy, ruminant/non-ruminant adipose fats via determination of  $\delta^{13}\text{C}$  values. This stable isotope approach has allowed for a deeper interpretation of results that can then be compared to corresponding zooarchaeological data.

Results from various extraction protocols indicate a wide range of subsistence strategies, with evidence of heavy meat consumption forming a common theme, as well as indications of natural resource exploitation (e.g. fishing, beeswax identification). This collaborative work establishes a greater understanding not only for dietary practices of the emerging political powers, but also potential socioeconomic influences and interconnections across regions, by evaluating subtle correlations in organic residue signatures. By cross-referencing with historical texts, faunal records, and other notable artefacts recovered from excavation, our analytical findings help to further elucidate questions regarding animal husbandry during these key socioeconomic turning points in Eastern European history.

## 12 MEDITERRANEAN MESOLITHIC-TO-MEDIEVAL MEALS: AN INTEGRATION OF NEW AND OLD STABLE ISOTOPE STUDIES ON DIET IN ITALY

**Abstract author(s):** Tykot, Robert (University of South Florida)

**Abstract format:** Oral

Over >30 years, a large amount of stable isotope research has been done on human remains from Italy, representing different time periods and geographic areas throughout the peninsula as well as in Sardinia and Sicily. While overall a lot of research, the actual number of sites/individuals is quite limited by time (especially pre-neolithic, Bronze Age, pre-Roman Iron Age), and geographic areas. In addition, when interpreting results and drawing conclusions, e.g. about similarities/differences between the data available, there are limitations when comparing several important issues between studies.

There are several fundamental issues that must be addressed for the best interpretations of isotope data on human bones and teeth: (1) cross-calibration of mass spectrometers between laboratories; (2) different sample preparation methods, for apatite/enamel samples; (3) different dietary calculations for apatite/enamel data; (4) having sufficient local and contemporary isotope values for plants/animals. Cross-calibration is straightforward, but use of different chemical procedures for preparing apatite/enamel has been shown to produce different isotope values. Furthermore, data interpretations vary, some using offsets based on controlled diets of rats and mice, rather than values for large domesticated mammals. This is critical for assessment of direct and indirect dietary contributions of C4 plants like millet, and aquatic resources, realized to be significant in some regions and time periods. Finally, there is significant variation in the baseline values of the food being consumed, due to natural/geographic variability, and especially human involvement in agricultural fields and animal foddering. In many cases, few if any isotopic studies have been done on local faunal remains to establish isotope baselines prior to interpretation of the isotope values for humans. Recommendations are made in this presentation of new isotope data on what can be done to at least minimize these issues in making conclusions about past diets in Italy and their changes over time.

CRUMBEL: STUDYING FOOD PATTERNS AND MOBILITY IN BELGIUM FROM THE LATE NEOLITHIC TILL THE MEROVINGIAN PERIOD

**Abstract author(s):** De Mulder, Guy (Ghent University) - Snoeck, Christpohe (Vrije Universiteit Brussel) - Capuzzo, Giacomo (Université Libre de Bruxelles) - Dale, Sarah - Sabaux, Charlotte (Ghent University) - Tys, Dries - Annaert, Rica - Hlad, Marta (Vrije Universiteit Brussel) - Vercauteren, Martine - Warmenbol, Eugène (Université Libre de Bruxelles)

**Abstract format:** Oral

The CRUMBEL-project aims to study the cremated remains of former populations in Belgium which are preserved in different collections across the country. Cremation was the dominant funerary ritual in Belgium (and also in northwestern Europe) between ca. 3000 BC and 800 AD. By using different scientific approaches the project aims to reconstruct the dietary habits and mobility from the former populations in the area.

Osteo-archaeology will help to determine the age and gender of the buried groups as well of the minimum number of people deposited in each grave. If possible indications of disease will be recorded also taking into account the limitations of studying cremated bone as a source for demographic information on past populations. Furthermore, a series of cremation graves will be radiocarbon dated to enhance the absolute chronological framework for this period. Analysis of carbon, oxygen and strontium stable isotopes will also be undertaken. Sr analysis will help to understand if the food of local communities is obtained regionally. It will further give insight in the mobility of the population between the late Neolithic and the Early Middle Ages. Within the framework of this project a map with the bio-available strontium in the different geological regions of Belgium will be constructed.

The running project is a cooperation between Ghent University (UGent) both Brussels universities (ULB and VUB) and the radiocarbon laboratory at the Royal institute for Cultural Heritage sponsored by the Excellence of Science budget (FWO-FNRS).

MEAT OR FISH? THE NEW ISOTOPIC AND HISTORICAL EVIDENCE OF 17-18TH C BASILIAN MONKS' DIET IN VILNIUS, LITHUANIA

**Abstract author(s):** Simcenka, Edvardas (Vilnius University; The Lithuanian Institute of History) - Jakulis, Martynas - Kozakaitė, Justina - Piličiauskienė, Giedrė (Vilnius University) - Lidén, Kerstin (Stockholm University)

**Abstract format:** Oral

The Union of Brest (1596) created a new Greek Catholic, or Uniate, church in the territories of Polish-Lithuanian Commonwealth. Uniates maintained their Byzantine-Slavonic traditions but accepted papal primacy. In 1617, most Orthodox monasteries were incorporated into a new Uniate monastic order - the Order of St Basil the Great, or Basilians.

Just like in other Christian monastic communities, the dietary behaviour of Basilian monks was restricted by various rules of their order. One such rule mandated fasting on specific days and liturgical seasons. During fasting, meat consumption was prohibited and, as replacement, the monastic meals featured various fish species. Since these dietary restrictions were even more severe among Eastern monastic communities (including Basilians), it would be reasonable to assume that, in the long-term, Basilians consumed more fish than meat.

However, by 1667 most of these dietary restrictions were loosened and meat consumption became more frequent. Since this study deals with the Basilian monks from the 17-18th C, when their dietary restrictions were supposedly more lenient, it is also possible that animal products featured more prominently in monastic meals than fish.

Therefore, the main aim of this study was to determine which food sources were the main components in Basilians' diets. For this aim, we used two different methods: 1) historical analysis of the available written sources; 2) stable isotope analyses of Basilians' bones which were recovered from the crypt beneath the Holy Trinity Uniate Church-Monastery in Vilnius, Lithuania.

These two different lines of evidence suggest two different possible dietary scenarios: the historical records point to fish as a main dietary component while the isotopic data indicate animal products as a main protein source. The potential reasons for these contradictions between historical and isotopic evidence and the most likely dietary scenario will be explored in this presentation.

PALEOPARASITOLOGICAL STUDY OF A FUNDUQ OF THE XII-XIII CENTURIES OF THE SAN ESTEBAN ARCHAEOLOGICAL SITE (MURCIA, SPAIN)

**Abstract author(s):** Gijón, Ramón - Lopez, Miguel Cecilio (Universidad de Granada) - Uriarte, María - Rodríguez, Jorge (Universidad de Murcia) - Iniguez, Alena (FIOCRUZ) - Botella, Herminia (Universidad de Granada)

**Abstract format:** Oral

The San Esteban archaeological site is composed of different structures, which were part of the Arrabal de la Arriaxaca, located outdoors of the city of Murcia in the Islamic period. Among these structures, the presence of a funduq stands out, dating back to the XII-XIII centuries. This space had an important role in the commerce of that time.

With this finding, it was decided to realize paleoparasitological studies, looking for evidence of parasites associated with this population. These parasitological evidences allow us to infer issues related to health and hygiene status, as well as the presence of domestic and peridomestic animals. We can also provide us with information about commercial routes, through the presence of endemic parasites of certain animal species.

This study has been carried out with sediment samples, taken from drainage ducts. These samples have been rehydrated with 0,5%

trisodium phosphate for 24-72 hours. We use an optical microscope to realize the visualization.

The analyses have revealed the presence of protozoa (Eimeria stiedae) and helminths (Ascaris sp., Trichuris sp., Capilaria sp.), which are associated with environmental and food contamination. These findings indicate high conditions of lack of hygiene, as well as the consumption of certain animal species, in case of the consumption of rabbits or hares.

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RECONSTRUCTING SUBSISTENCE PATTERNS AT LYDENBERG HEADS SITE, SOUTH AFRICA USING LIPID RESIDUE ANALYSIS

**Abstract author(s):** Becher, Julia (University of Tuebingen) - Schoeman, Alex (University of the Witwatersrand) - Whitelaw, Gavin (KwaZulu-Natal Museum) - Celliers, Jean-Pierre (Lydenburg Museum) - Spiteri, Cynthianne (University of Tuebingen)

**Abstract format:** Poster

Organic residue analysis (ORA) has been routinely used over the past three decades and is a well-established technique to identify cuisine and food processing within a group. This project applies ORA to Early Iron Age ceramics from Lydenburg Heads Site in South Africa, which was occupied by a Urewé Tradition farming community in the seventh century AD, and by a Kalundu Tradition farming community from the ninth to eleventh centuries AD. Other EIA sites were found in the area around Lydenburg which would allow comparative analysis. Nevertheless, the excavated data seem inadequate. Furthermore, the acidic nature of the soil at Lydenburg Heads Site resulted in poor organic preservation.

As dietary reconstructions were limited within Mpumalanga Province, little is known about early farmer subsistence patterns and the majority of research on the EIA in this region has focused on a typological and ethnographic scale.

For this study, 40 sherds were sampled (Urewé occupation, n=20; Kalundu occupation, n=20) to test the lipid preservation in pottery from eastern South Africa. The study aims to contribute new insights on diet and pottery function of Lydenburg Heads Site through a combined lipid biomarker and compound specific isotopic approach. It represents the first ORA study ever conducted in this area and in this archaeological context.

NOT ANOTHER 25 YEARS! COMBATting HARASSMENT AND ASSAULT IN ARCHAEOLOGY [AGE]

**Theme:** 7. 25 years after: The changing world and EAA's impact since the 1995 EAA Annual Meeting in Santiago

**Organisers:** Coltofean-Arizancu, Laura (Archaeology and Gender in Europe - AGE - Community of EAA; University of Barcelona) - Berg, Ingrid (Swedish Archaeological Society)

**Format:** Discussion session (with formal abstracts)

Archaeology suffers from a culture of harassment. The 25th anniversary of the European Association of Archaeologists is the perfect opportunity to reflect on the organisation's role in safeguarding a working environment characterised by inclusion and equal opportunity. Being aware of the importance of involvement in contemporary matters, the Archaeology and Gender in Europe (AGE) Community of the EAA proposes a discussion session on the modes of preventing and addressing all forms of harassment and assault in archaeology. These offensive behaviours include, but are not limited to sexual harassment and assault; gender, racial, religious, personal, sexual orientation-based, age-based and disability-based harassment; psychological and power harassment; physical harassment and assault; online harassment; and retaliation. This session aims to gather experts both within and outside archaeology to share their experiences in working on these issues both on an organizational and individual level. We welcome papers that deal with any of the following topics: examples of anti-harassment measures (e.g., policies, procedures, petitions) taken for the protection and support of victims, as well as the process, effectiveness and outcomes of implementing them; examples of actions designed to encourage survivors to disclose and report incidents of misconduct (e.g., through online campaigns, surveys), their results and efficacy; awareness-raising projects targeting both victims and perpetrators, in particular actions taken to change and prevent problematic behaviour; and the current status of anti-harassment measures adopted within the archaeological communities and associations of various countries. The final scope of this session is to create a task force which would use the conclusions and recommendations resulted from the debates to draft an anti-harassment policy and procedure proposal. This document would be subsequently discussed and implemented within the EAA to ensure a safe and inclusive environment to its members.

ABSTRACTS

SERBIAN ARCHAEOLOGY AND THE RISE OF THE AWARENESS OF SEXUAL ASSAULT

**Abstract author(s):** Balaban, Radmila - Milosavljević, Monika (University of Belgrade)

**Abstract format:** Oral

Throughout its history in Serbia, archaeology has played a significant role in the emancipation of society in general. Thus, archaeology strongly has contributed to the empowerment of women in the profession: from fieldwork to university teaching. The question that this presentation posits is whether this general tendency of inherited emancipation can be maintained in the face of rising patriarchal pressures. If female roles have declined, it behoves the question of how archaeological practice contributes to gender inequality.

Despite trends to re-patriarchalism, there has been unexpected positive developments for Serbian archaeology with the adoption

of the Policy on Protection Against Sexual Harassment and Assault at the Faculty of Philosophy, University of Belgrade (Serbia), in December 2019. From a total of 31 individual faculties under the jurisdiction of the University of Belgrade, so far only one has had a similar Policy – the Faculty of Political Science. The existence of such a policy is especially important for the Department of Archaeology, as it addresses field and museum practices for its students. Nevertheless, some issues are unresolved which need further discussion.

The Department of Archaeology is but one of ten departments of the Faculty of Philosophy, at the University of Belgrade; consequently, the specific needs of archaeology are not recognized in detail in the policy itself. To overcome such shortcomings, it is necessary to speak publicly about examples of good practice in cooperation with non-governmental organizations as they are more experienced in these areas. It is also necessary to provide a space for students to hear their problems first-hand.

The aim of this paper is to shed light on the rise of sexual-assault awareness in Serbian archaeology as to discuss possible future directions of where awareness may be applied in practice.

2 **BREAKING THE TABOO: HARASSMENT AND ASSAULT IN CENTRAL-EAST AND SOUTH-EAST EUROPEAN ARCHAEOLOGIES**

**Abstract author(s):** Coltofean-Arizancu, Laura (University of Barcelona; Archaeology and Gender in Europe - AGE - Community of EAA) - Gaydarska, Bissierka (Archaeology and Gender in Europe - AGE- Community of EAA) - Plutniak, Sébastien (TRACES, University of Toulouse)

**Abstract format:** Oral

In recent years, the practitioners of archaeology have slowly begun to publicly open up about the harassment and assault that occur within the discipline in different settings (e.g., universities, fieldwork) and regardless of gender. However, research on this topic and disclosures have mostly taken place in Western archaeologies and have especially focused on sexual misconducts. Yet, in Eastern archaeologies, this matter is predominantly still a taboo which is often only discussed in small, private and unofficial circles. In response to the status quo, in 2020 the board of the Archaeology and Gender in Europe (AGE) Community of the European Association of Archaeologists (EAA) carried out a survey to determine the degree to which various forms of harassment and assault happen in Central-East and South-East European archaeologies. The survey particularly centred on three countries – Hungary, Romania and Bulgaria – and addressed offensive behaviours that include sexual harassment and assault; gender, racial, religious, personal, sexual orientation-based, age-based and disability-based harassment; psychological and power harassment; physical harassment and assault; online harassment; and retaliation. The survey assessed whether the professionals and students of archaeology in these countries 1/ are aware of the existence of harassment and assault in their working, research and study environments; 2/ have been the recipients of such acts and if yes, 3/ in which ways did these affect them on a personal and professional level, 4/ whether they reported them and 5/ if any measures were taken. This paper presents and discusses the results and efficacy of the AGE survey, and it reflects on the measures that could be taken to prevent such incidents, to protect and support the victims, and to change the behaviour of perpetrators.

3 **GENDER-BASED INTIMIDATION, HARASSMENT AND VIOLENCE IN FIELD SETTINGS: RESULTS FROM THE 2014, 2015 AND 2019 SURVEYS**

**Abstract author(s):** Nakhai, Beth (University of Arizona)

**Abstract format:** Oral

In 2014, 2015 and 2019/2020, I circulated a Survey on Field Safety: Middle East, North Africa, and Mediterranean Basin. The survey was designed to understand the ways in which archaeological fieldwork does – or does not – provide a safe and secure setting for all participants. In particular, it focused on physical and emotional safety from intimidation, harassment and violence based on gender, sexual orientation, and/or gender identity. It looked, as well, at gender-based discrimination in the field and at the ramifications of such discrimination in academic and professional settings. The data provided in response to the survey’s 70 or so questions, and derived from some 650 responses over the course of half a dozen years, offers important insights into excavation culture. It illuminates acceptable and unacceptable behaviors, and highlights legal and ethical issues that every field project must address. In some instances, it points to changes that have occurred over these past few years as a consequence of attention to this urgent topic, and in other instances, it indicates a lack of substantive change. Overall, it is clear that concerted, systemic, on-going remediation is imperative.

4 **THE ITALIAN FEMALE ARCHAEOLOGICAL ENVIRONMENT BETWEEN RESPECT AND VIOLATIONS**

**Abstract author(s):** Giorgio, Marcella - La Serra, Cristiana - Cerbone, Oriana - Leonelli, Valentina - Pennisi, Ghiselda - Manca di Mores, Giuseppina - Malorgio, Margherita - Garrisi, Alessandro (Associazione Nazionale Archeologi)

**Abstract format:** Oral

Professional archaeology in Italy is a woman. Thanks to the female pioneers of Italian archaeology, the profession, over the decades, has taken on an increasingly feminine face, to the point that in recent years statistics are that 70% of those employed in archaeology are women. The lack of social protection often makes female workers to abandon this activity around the age of 35/40, when family needs lead to greater economic and social stability.

Treatment of Italian archaeologists in workplaces is quite uneven. Significant differences are found between Northern, Central and Southern Italy, not only for wages, but also due to various types of discriminations.

However, in the difficult context of Italian freelancers, there may sometimes be favourable situations coming from local environments and from care and activity of unions and associations fighting for the protection of female workers’ rights.

The purpose of our paper is to present the Italian data and compare them with similar European working areas, in order to find common solutions to the problems and inconveniences afflicting women archaeologists.

The Italian National Association of Archaeologists has taken over the years clear commitments to these topics and, after the experience of TAG UCLA 2019, is planning a special help desk for women workers. We aim to discuss and face the problem, looking for common solutions and attitudes that can engage more countries in the prevention of harassment in workplaces.

5 **COMBATING SEXUAL HARASSMENT IN UK ARCHAEOLOGY: THE BAJR RESPECT CAMPAIGN**

**Abstract author(s):** Hawkins, Kayt (Kathryn) (Archaeology South-East, Institute of Archaeology, University College London) - Rees, Cat (CRArchaeology) - Connolly, David (BAJR)

**Abstract format:** Oral

This presentation will highlight the work of the UK BAJR Respect Campaign, a voluntary group formed in 2017. The Respect Campaign provides an initial point of reference for all practicing archaeologists in the UK, whether in the commercial, academic or voluntary sectors, through signposting services and creating procedures to help prevent cases of bullying and harassment, including sexual harassment. The Respect Campaign collaborates closely with other UK voluntary bodies such as Mentoring Women in Archaeology (MWAH), the CIFA Equalities and Diversity Group, Prospect Union (archaeology branch), British Women Archaeologists (BWA) and others to provide a unified force for change within UK Archaeology, more recently under the newly formed umbrella organisation IDE-AH (Inclusion, Diversity Equality in Archaeology and Heritage). Initiatives by the Respect Campaign have involved the creation of safe online spaces for women and LGBT+ archaeologists, consultation with the Chartered Institute for Archaeologists (CIfA), awareness raising through presentations at conferences and university student days, provision of confidential support for those experiencing bullying and/or sexual harassment, sector surveys and the promotion of best practice; a number of these, and their impact will be explored in this paper.

6 **THE POSITIVE POWER OF SOCIAL MEDIA WITHIN WOMEN AND LGBTQIA+ SPACES**

**Abstract author(s):** Talbot, Amy (University of Bradford)

**Abstract format:** Oral

In December 2018 myself and three female friends, all with very different archaeological and heritage experiences set up a group on Facebook called Mentoring Women in Archaeology and Heritage (MWAH). This was set up alongside the Respect anti-bullying and harassment campaign. At the time of writing this abstract, the group membership has reached over 800+ individuals and the name has been altered to reflect our growing LGBTQIA+ members to Mentoring WomXn in Heritage and Archaeology.

We have participants from over 15 countries including the United Kingdom, USA, Canada, Australia, Iceland, New Zealand, Poland, and the country of South Africa. I have also used my experience and connections from MWAH to create the Seeing Red period and menstruation guide which is currently being rolled out across UK commercial archaeology. Having social media spaces such as the Mentoring and the Respect anti-bullying and harassment groups have been integral to equipping women and LGBTQIA+ minorities with much needed networking and confidence boosting skills, as well as allowing an informal area for general discussions and networking within the industry.

Our primary platforms are Facebook and Twitter which we use to facilitate discussions and provide networking opportunities to our members and followers. We also provide Facebook group threads for live-time question and answer sessions where anyone in the group can talk about issues that are observed within the archaeology and heritage sectors. Recently I ran an online survey through these groups which gave us data on how joining these groups, and creating women and LGBTQIA+ spaces has provided necessary support at grassroots level to minority groups, as well as an increase in mental health and general well being through being part of a wider, safe community. This includes data where many individuals were more confident to raise issues such as bullying in the workplace.

7 **#UTGRÄVNINGPÅGÅR #EXCAVATIONINPROGRESS**

**Abstract author(s):** Aldén Rudd, Petra (Rio Göteborg) - Ramström, Annica (Arkeologgruppen)

**Abstract format:** Oral

During the autumn of 2017, the hashtag #metoo started circulating on social media platforms around the world. A global culture of allowing men to diminish women and to impinge on our fundamental rights, without repercussions, was brought into the light. This culture is dependent on silence. If we talk, we lose. So, women followed the rules. Until now.

During the Swedish #metoo movement, hashtags for specific professions were created. This inspired many women to take a stand with those who, within their profession, were breaking the silence, sharing their stories, supporting each other, and organizing the movement. In November 2017, a group for Swedish archaeologists with the hashtag #utgrävningpågår (#excavationinprogress) was created. The Facebook group quickly grew to over 700 members and the group was flooded with testimonies of sexual harassment



and violations, both from the past and in the present. When #utgrävningpågår was presented to the media and published in the national newspaper Dagens Nyheter on November 30, 2017, 387 archaeologists had signed the statement against harassment. #utgrävningpågår at large was well-received by the Swedish archaeological community. Many men, as well as women, were alarmed by what they read, and there were widespread calls for action. In 2020, the work of #utgrävningpågår continues, with an unaltered determination to make the working environment safe for all of Sweden’s archaeologists. This paper will outline the work process behind the appeal for change, the people involved, and how we work, together, towards our common goal.

8 FEMALE ARCHAEOLOGISTS IN DEVELOPER-FUNDED SECTOR IN EUROPE: “STILL STRUGGLING BUT UNITED!”

**Abstract author(s):** Mazzilli, Francesca (Cambridge Archaeological Unit, University of Cambridge; McDonald Institute for Archaeological Research, University of Cambridge; University of Bergen) - Watson, Sadie (MOLA - Museum of London Archaeology) - Simões, Sara (Cambridge Archaeological Unit, University of Cambridge; STARQ- Sindicato dos Trabalhadores de Arqueologia/ Portuguese Union for Archaeologists) - Brito, Sara (STARQ- Sindicato dos Trabalhadores de Arqueologia/ Portuguese Union for Archaeologists)

**Abstract format:** Oral

Archaeological conferences have introduced ‘Best Practice Code of Conduct’ which explicitly states that any forms of harassments will be not tolerated. EAA and TAG have been hubs of discussion for years about gender and archaeology. WCCWiki is an initiative run by the Women’s Classical Committee UK to redress gender imbalance in Wikipedia pages of scholars in the field of classics and archaeology. Founded in 2008, British Women Archaeologists (BWA) is a group interested in sharing and discussing the achievements and challenges of women working and studying in archaeology, heritage, and museums. Prospect is a trade union that also aims to tackle sexual inequality in commercial, public sector and charity sector archaeology in UK. The Italian National Association of Archaeologists (ANA) has made constant commitments in discussion on gender equality, and the “Conciliando” Project was carried out by Conprofessioni Sardegna to help women freelance. These are some examples of initiative to tackle gender inequality in (developer-funded) archaeology across Europe, although much more still needs to be done: female archaeologists still have to deal with major gender inequalities in the commercial sector as pointed out in our recent session ‘Gender and power in developer-funded archaeology’ at TAG 2019 at UCL, London. Our contribution to the EAA session is to share our experience drawn from the session at TAG and share the voices of our panellists, of audience and archaeologists who have also reached out on twitter. We aim to create a social media platform to discuss gender issues in developer-funded archaeology across Europe, share personal experiences and to carry out future initiatives to promote gender equality, by joining forces with other female archaeologists.

372 NETWORKS OF CHRONOLOGY AND CHRONOLOGICAL NETWORKS

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Adams, Sophia (SUERC, University of Glasgow) - Armada, Xosé-Lois (Institute of Heritage Sciences, Spanish National Research Council - Incipit, CSIC) - Črešnar, Matija (University of Ljubljana)

**Format:** Regular session

This session explores the current state of studies of chronology in European prehistory. The typo-chronologies of the past with their culturally specific terminology are being challenged through a variety of scientific approaches. Here we offer the opportunity for researchers to present and compare the results of their own chronological research both locally and internationally focussed. Papers are invited that assess the impact of scientific dating methods on our understanding of the chronology of a period or region, artefact, structure or site type. Studies may be focussed on types of structures such as roundhouses or site forms such as hillforts; they may examine the dating of technologies or types of objects or revisit chronological frameworks; they may explore the chronology of a specific region and how this compares or contrasts with broader national or international frameworks. Presentations should be as much about questioning the status quo as about sharing new data or analytical results. Can we build a revised chronology across Europe tied to calendar date ranges rather than interpretive typological categories? If so, what does this revised chronology look like? Can we set aside the site type terminology which is built on exceptional rather than typical sites e.g. Hallstatt and La Tène? May we even discard the material biased three age system: Stone, Bronze and Iron Ages? If we avoid these traditional structures do we free ourselves to have a more effective conversation across Europe for change, interaction and communication networks? Or do we risk losing touch with the connecting factors? Does a calendar based chronology allow us to see networks more clearly or identify networks that were previously obscured by the confines of typo-chronologies? We cannot avoid typology when constructing chronologies from the incomplete archaeological record, so how do we resolve the need for typology to construct chronology?

ABSTRACTS

1 CONSTRUCTING IRON AGE CHRONOLOGIES

**Abstract author(s):** Collis, John (Dept of Archaeology, University of Sheffield)

**Abstract format:** Oral

At the AFEAF conference held in Angoulême in 1984 (published in 1986) I suggested that if we abandoned the terms Hallstatt

and La Tène we might re-write the protohistory of temperate Europe. The terms were confused as sometimes they were used as chronological periods and sometimes as ‘Culture Groups’ though the original meaning may have referred more to different ‘styles’ (in art, pottery decoration and metal artefacts). There was also confusion about the different methods of construction of chronologies with concepts such as ‘periods’ defined by ‘type fossils’ (e.g. the Reinecke system) which had been taken over from Geology; ‘seriation’ (originating with Flinders Petrie in Egypt); and ‘horizons’, with the appearance of a single attribute (e.g. the stone / bronze / iron of the Three Age System, or Tischler’s brooch chronology). My own approach has been based on seriation starting from stratified groups of finds from individual sites, the construction of local / regional chronologies and the use of specific attributes to mark horizons which can then be used to link sites and regions. It also assumes that ideas spread between different communities along various types of network and that ideas (and people) will be moving in many different directions rather than from one source as assumed in invasionist interpretations. Thus new individual attributes can appear anywhere in the network, and the order in which they appear can vary from one region to another. Potentially the order of horizons can be changed without destroying the whole system as happens in traditional chronology construction. The problem however arises of nomenclature, what to use – at present I am using specific sites / features as the basis, with horizons named after the relevant attribute, the name of the scholar who originated a chronology, and words like La Tène as merely stylistic.

2 CONNECTING ARTEFACTS WITH CALENDAR-BASED CHRONOLOGIES

**Abstract author(s):** Hamilton, Derek - Adams, Sophia (SUERC, University of Glasgow)

**Abstract format:** Oral

The typologies of portable artefacts have been the mainstay of chronologies in Iron Age Europe for generations. Complex networks of connections have been drawn between objects found in burials in non-literate regions with those from the Mediterranean and Roman world; the latter dated by their historical context connected to texts of the time. The depth of artefactual and historical knowledge required to develop these systems is commendable and should be respected but may also be challenged. They rely on several assumptions that form the links in these chains of dating. Primary is the assumed length of time required for an object or idea to move from a proposed place of origin to the site and context that is being dated. Second to this are assumptions made about the transfer of skill, technique and design: these overemphasise a desire to emulate in place of individual creativity and experiment. These systems should also be regularly revised as new research is carried out on evidence within the chain of connections but this so rarely happens.

Instead we propose an independent approach to dating artefacts. This enables researchers to assess and revise the chronological markers in object typologies without the need to revisit every stage in the chain of dating. By radiocarbon dating organic remains deposited in direct association with objects of specific type we obtain a calibrated date range in calendar years. Dates that may be compared across regions, chronological systems and extended typologies. The traditional systems then provide the structure upon which to model the data to tighten up the date range without relying on subjective assumptions. In this paper we will present the results of our project that has tested this methodology through the medium of Iron Age brooches.

3 INVESTIGATING TEMPORAL PROCESSES OF CHANGE IN MATERIAL CULTURE. A CASE STUDY OF URNFIELD ASSEMBLAGES FROM DENMARK

**Abstract author(s):** Rose, Helene (Centre for Baltic and Scandinavian Archaeology; CRC 1266, Kiel University) - Meadows, John (Centre for Baltic and Scandinavian Archaeology; Leibniz-Laboratory for AMS Dating and Stable Isotope Research, Kiel University; CRC 1266, Kiel University)

**Abstract format:** Oral

The chronological frameworks of Pre-Roman Iron Age in Denmark (c.500-200 BC) are based on traditional artefact typologies, but researchers have shown it to be difficult to harmonize metal and ceramic typologies, possible reflecting a differential chronological sensitivity of the material. The period coincides with a major plateau in the IntCal13 radiocarbon calibration curve c.750-400 cal BC (the so called ‘Hallstatt’ plateau), resulting in long and unhelpful calibrated probability distributions. A wiggle in the curve around 350-250 BC has however proved more influential on our analyses, as it produce bi-modal solutions towards the end of the Pre-Roman Iron Age.

We present a large data set of new radiocarbon dates on primarily cremated bone from Aarupgaard, Aarre and Søhale urnfield cemeteries in southern Jutland, Denmark. The cremated bone dates are corrected for wood-age offsets using formal outlier modelling. Burial dates provide an indirect date of the context associated cremation urn and metal artefacts. We combine the radiocarbon evidence with prior knowledge of site formation processes in a Bayesian chronological framework, and model a wide range of ceramic and metal artefact currencies. We investigate small scale change: the rate at which new types are introduced and abandoned; how long types are in use; temporal overlap between types; chronological sensitivity of individual types. We use this information to identify possible periods of rapid change in the material culture, and to test if the radiocarbon evidence supports the exiting typo-chronologies. Providing calendar date ranges of transformation periods in the Danish Pre-Roman Iron Age, allow us to relate these to chronological events across Europe.

4 **WHEN ONLY TYPOLOGY REMAINS. NEW RESEARCH ON EARLY IRON AGE STANOMIN STYLE ORNAMENTS FROM CENTRAL EUROPE**

**Abstract author(s):** Maciejewski, Marcin (Institute of Archaeology Maria Curie-Skłodowska University)

**Abstract format:** Oral

In the study of the chronology of the Late Bronze and Early Iron Ages (Lusatian Urnfield culture), from the beginning of archeology, research results based on analyses of metal objects (especially coming from hoards) were perceived as more valuable than the ones built on other categories of archaeological finds. In recent decades, due to the results of dendrochronological and 14C analyses (especially for western Poland – Wielkopolska, and Silesia), traditional divisions have been corrected. However, this did not have a significant impact on the chronology of metal artifacts. It breaks down the hitherto clear pattern of cultural processes in the early Iron Age in the Odra and Vistula basins and raises many interesting research questions.

One of the groups of metal artifacts characteristic of this period is Stanonim style ornaments. They have been located in the region from Denmark to western Ukraine, with the largest concentration in eastern Poland (Kuyavia, Masovia, and Małopolska). These characteristics, massive and often richly ornamented bronze arm and leg rings, necklaces and pins most often appear in hoards and are perceived as chronological diagnostic artifacts. This group of objects is the basis of project results presented in this paper. Is it possible to create a more detailed typology for these artifacts? Will it enable us to create more detailed chronological divisions? To what extent is it possible to synchronize chronological research results from different regions that base on different categories of archaeological finds? Could observations, which have previously not been used in research on chronology so far – use-wear traces – be valuable in this type of research? These are the basic research questions. By answering them, I would also like to consider whether a return to known and repeatedly published archaeological sources makes any sense.

5 **MASSIVE METALWORK DEPOSITION IN ATLANTIC EUROPE DURING THE LATE BRONZE AGE – IRON AGE TRANSITION: TOWARDS A REFINED CHRONOLOGY?**

**Abstract author(s):** Armada, Xose-Lois (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC)

**Abstract format:** Oral

Large quantities of bronze -amounting to tons- were buried in isolated hoards in Europe during the final stages of prehistory, mainly during the Bronze Age and extending into the Iron Age. This practice was particularly intense on the Atlantic façade of the continent and, despite many years of research and lengthy scientific discussion, even today we do not understand what motivated such disparate and widespread communities to express themselves in this way.

The hoards of mass-produced and unused (as-cast) axes with high levels of lead and/or tin that appear in several areas of the European Atlantic façade during the Late Bronze Age - Iron Age transition constitute an enigmatic piece in this puzzle. They spread in specific areas of the Atlantic region (southern Britain, Brittany, northwestern Iberia...) in a period that, roughly speaking, can be dated c. 800-600 BC. Alongside the issues connected to the social explanation of this phenomenon, its accurate chronology also constitutes a challenge for research. Does it start and end at the same moment in all these areas? How do it relate with other aspects of the archaeological record that can be more precisely dated?

Although metal hoards have usually been dated through typo-chronological approaches, new methods and perspectives emerged in the last years. These include the radiocarbon dating of organic remains preserved in metal artefacts, the recording of bronzes in modern archaeological excavations, and the use of chemical and lead isotopic data to infer relative chronological sequences. The aim of this contribution is to assess the usefulness of these perspectives for a refined chronology of the massive metal production and deposition in the Atlantic area. We will argue that, despite the progress made in recent years, some chronological problems still persist.

6 **HOW ABSOLUTE DATING METHODS CHANGED THE STUDIES OF BRONZE AND IRON AGES IN THE SOUTH-EASTERN ALPINE REGION**

**Abstract author(s):** Cresnar, Matija (University of Ljubljana; Institute for the Protection of Cultural Heritage of Slovenia) - Armit, Ian (University of York) - Mason, Philip (Institute for the Protection of Cultural Heritage of Slovenia) - Harris, Samuel - Batt, Catherine (University of Bradford) - Mele, Marko (Universalmuseum Joanneum) - Potrebica, Hrvoje (University of Zagreb) - Czajlik, Zoltán (Eötvös Loránd University)

**Abstract format:** Oral

Combining the results of (traditional) typo-chronology with different (modern) methods of absolute dating has had an important impact on recent studies of the Bronze and Iron Ages in Slovenia. As a result of a milestone decision at the level of heritage protection more than two decades ago, all extensive development-led interventions (e.g. excavation accompanying motorway construction) have also included the financial means for post-excavation research, which besides the basic studies includes absolute dating, mostly employing the radiocarbon method. The amount of available archaeological material also dated by scientific methods, resulting from these interventions, has reached the point, where new ideas about late prehistory and their dynamics can be approached.

Research projects such as Absolute dating of Bronze and Iron Ages in Slovenia (Slovenian Research Agency), Encounters and Transformations in Iron Age Europe (HERA) and Iron Age Danube (Interreg DTP) have added a new layer of information, due to the inclusion of chronologically important sites and significant contexts into the analysis. Besides that, the projects broadened the research to

comparable sites mainly dating to the Early Iron Age in other countries in the region (Croatia, Austria, Hungary).

Furthermore, greater attention to sampling strategies for radiocarbon dating has also significantly increased the quality of information acquired. Besides the most frequent radiocarbon method, dendrochronology and geomagnetic dating have also been used in some systematic investigations of Bronze and Iron Age sites and contexts.

Although all these data is compatible, a lot of attention has to be taken when combining the various strains of information and interpreting contexts and sites, as well as broader regional or transregional cultural dynamics and networks.

376 **NETWORKS AND MOBILITY IN THE 3RD-2ND MILLENNIUM BCE BETWEEN THE MIDDLE-DANUBE AND THE ADRIATIC AREA: NEW IDEAS AND INTERDISCIPLINARY APPROACHES**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Cavazzuti, Claudio (Institute of Archaeology, Hungarian Academy of Science; Museo delle Civiltà in Rome) - Arena, Alberta (Sapienza Università di Roma) - Gavranović, Mario (Institut für Orientalische und Europäische Archäologie OREA, Austrian Academy of Science, Vienna) - Kiss, Viktória (Institute of Archaeology, Hungarian Academy of Science) - Mehofer, Mathias (Vienna Institut für Archaeological Science - VIAS, University of Vienna)

**Format:** Regular session

During the past decades, manifold archaeological studies have emphasized the existence of interaction networks operating in the area comprised within the middle course of the River Danube and the Adriatic area between Late Neolithic and the Bronze Age. Previously suggested connections, as well as human mobility patterns can now be better explored through the application of innovative methodologies.

The session aims discuss new approaches and gather and new data about the movement of people, raw materials, and manufactured goods, as well as the introduction and exchange of (metal) technologies and ideas within the area of the Carpathian Basin, the Alps, the Balkans and the Italian peninsula. Terrestrial, sea- and river-borne interactions and mobility dynamics in the timeframe of the third and second millennium BCE can be addressed both at the regional and at the supra-regional scale, applying different investigation methods – from traditional artefact-based and archaeometallurgical analyses to other innovative approaches such as isotope analyses and aDNA.

It is expected that single case studies may contribute to empower historical reconstructions. At the same time, they should set the tone for wide-ranging reflections on the diffusion of innovations as well as on the methods applied in archaeology to investigate social interaction and its transformative power.

**ABSTRACTS**

1 **THE ROLE OF THE SOUTH EASTERN ALPS IN THE COPPER METALLURGY OF THE 3RD-2ND MILLENNIA BC**

**Abstract author(s):** Angelini, Ivana (Department of Cultural Heritage, University of Padova) - Canovaro, Caterina - Nimis, Paolo - Artioli, Gilberto (Department of Geosciences, University of Padova)

**Abstract format:** Oral

Recent analyses of the metal axe of the Iceman and other objects from Northern Italy [1-2] indicate that copper in the second half of the 4th millennium mainly derived from Tuscan minerals, in agreement with the evidence provided by the coeval smelting site of San Carlo, and by the studied metal objects related to the Rinaldone Culture [3].

New data on the metal hoard from Pigloner Kopf (Bolzano, Italy, dated to the first half of the 3rd millennium BC) point to this copper as the earliest extracted in the South-Eastern Alps. The exploitation of the copper ores in the area increase considerably in Late Chalcolithic, as proven by the presence of numerous smelting sites and well-provenanced objects from Northern Italy [2, 4-5]. In the Early and Middle Bronze Age the archaeological evidences of smelting activities in the South-Eastern Alps are rare if not absent, although the few available isotopic data of Italian finds indicate that Alpine copper is in use. Interestingly, recent works on Central European and Scandinavian artefacts support the exploitation of Alpine copper and the trade of the metal to the North [7]. In the Late Bronze Age, the copper ores of the South-Eastern Alps are systematically tapped and plentiful smelting sites are present in the area. Remarkably, the diffusion pattern of the Alpine metal seems to change, being scarce in Northern Europe [7] but widespread South of the Alps [6].

The contribution will discuss in detail the evidence and the complexity of Southern Alpine copper exploitation through the 3rd and 2nd millennia BC.

[1] Artioli et-al.,2017,PlosOne doi.org/10.1371/journal.pone.0179263

[2] Artioli et-al.,2020,Archaeometry doi.org/10.1111/arcm.12542

[3] Dolfini et-al.,2020,PlosOne doi.org/10.1371/journal.pone.0227259

[4] Angelini et-al.,2011, Quaderni Archeologia Veneto,pp.107-105

[5] Artioli et-al.,2015, AS doi.org/10.1016/j.jas.2015.08.013



[6] Ling et-al.,2019,JASR doi.org/10.1016/j.jasrep.2019.05.002

[7] Canovaro et-al.,2019,AAS doi.org/10.1007/s12520-019-00827-2.

## 2 CONTACTS AND MOBILITY BETWEEN THE CARPATHIAN BASIN AND THE TRIESTE KARST BASED ON MULTIDISCIPLINARY INVESTIGATIONS OF THE LJUBLJANA CULTURE POTTERY

**Abstract author(s):** Leghissa, Elena (ZRC SAZU, Institute of Archaeology) - Montagnari Kokelj, Manuela (Department of Humanities, University of Trieste) - Colin, Eugenia - De Min, Angelo (Department of Mathematics and Geosciences, University of Trieste) - Kiss, Viktória (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences) - Prokop, David (CEITEC-Central European Institute of Technology; Brno University of Technology, Institute of Physical Engineering) - Kasztovszky, Zsolt - Szilágyi, Veronika - Harsányi, Ildikó (Nuclear Analysis and Radiography Department, Centre for Energy Research) - Bernardini, Federico (Centro Fermi, Museo Storico della Fisica e Centro di Studi e Ricerche; Multidisciplinary Laboratory, The “Abdus Salam” International Centre for Theoretical Physics)

**Abstract format:** Oral

The Deschmann’s pile-dwellings near Ig (Dežmanova kolišča pri Igu), close to Ljubljana, are probably one of the most famous pile-dwellings of the 3rd millennium BC in the Alpine region: the first excavations were carried out in the 1870s and resumed only c. 90 years later in the same and adjacent areas of the Ljubljana Marshes (Ljubljansko barje). The publication of the materials by J. and P. Korošec in 1969 opened the way to various cultural interpretations, the most recent of which is that by E. Leghissa in 2017: according to her the older phase (28th – 26th century BC), is characterised by pottery of the so-called Ljubljansko barje variant of the Vučedol Culture (redefinition of Phase Ig I after Korošec 1959 and of Late Vučedol period-Vučedol C after Dimitrijević 1979), while the younger one (26th century BC to 25th century BC) has been named Ljubljana Culture (redefinition of Phase Ig II of Korošec 1959 and of Alpine variant of the Ljubljana Culture of Dimitrijević 1979 and of Classical Ljubljana Culture of Govedarica 1989). This study stresses numerous similarities of the Slovenian materials with the pottery of contemporary central European cultures, especially of Somogyvár-Vinkovci and Makó-Kosihy-Čaka cultures, but also with the closer Italian Karst, as indicated already before by other scholars.

To check hypotheses based on typological comparisons and try to determine the mechanisms of cultural interactions that connected more or less distant regions, destructive – X-ray diffraction and optical microscopy – and non-destructive analyses – X-ray computed microtomography and prompt gamma activation analysis – have been carried out thanks to the collaboration of an interdisciplinary international team. The results obtained so far for the pottery materials attributed to the Ljubljana Culture will be presented at the EAA Conference in Budapest.

## 3 LIVING ON THE EDGE: BRONZE AGE CERAMIC PRODUCTION AND EXCHANGE IN EASTERN HUNGARY

**Abstract author(s):** Golitko, Mark (University of Notre Dame) - Kreiter, Attila (Hungarian National Museum) - Riebe, Danielle (University of Illinois at Chicago) - Duffy, Paul (University of Toronto) - Parditka, Györgyi (University of Michigan)

**Abstract format:** Oral

The Körös River and its drainages lie to the east of the Tisza River in eastern Hungary and western Romania. This region is considered relatively marginal to the major routes of transport crossing Bronze Age Europe like the Danube. Yet the region was not isolated from wider developments during this time, sharing in the spread of motifs, metallurgical knowledge, and potentially the movement of people from a wider region of Eurasia. Here, we focus on the results of compositional analyses of ceramics from Bronze Age settlements in eastern Hungary dating primarily to the Middle and Late Bronze Age (c. 1600-1280 BC), in particular, the cremation urn cemetery of Békés103 (Jégvermi-kert). The estimated size of the cemetery suggests that the cemetery integrated several surrounding communities. In comparison to several neighboring tell sites and a large scale regional clay survey, we examine the degree to which ceramics at the cemetery indicate social ties to surrounding settlements, and how these settlements may have integrated more broadly into surrounding Bronze Age socio-economic networks.

## 4 GLOBAL VILLAGE AT THE BEGINNING OF THE MIDDLE BRONZE AGE –ALILOVCI (CROATIA) - CASE STUDY

**Abstract author(s):** Mavrovic Mokos, Janja (Faculty of Humanities and Social Sciences, Department of Archaeology, University of Zagreb)

**Abstract format:** Oral

For the first time, the research of this site has provided a detailed and stratigraphically reliable insight into the appearance of residential structures at the beginning of the Middle Bronze Age in Croatia. Alilovci are situated in the Požega Valley, which is located on a favourable communication route and sheltered by mountains from all sides. Despite its compactness, this mountainous area is strategically open to a very important communication route – the Sava River, which played a significant role throughout prehistory. This made Alilovci a safe place to live during the Middle Bronze Age as it was in the hinterland, surrounded by mountains, and provided a relatively quick exit to the Sava River, alongside which ran a prehistoric trade route. In this way Alilovci were connected to the whole Carpathian Basin. Those connections are visible on several levels. Some types of pots and bowls have almost identical counterparts that can be found at well-known sites in Austria, Hungary and Slovakia. In addition, decorating with plastic applications with a triangular cross section that have been found on several pots can be linked to the impulses associated with the area of the Tumulus culture. This relative chronological situation has been confirmed by radiocarbon dating, which has provided series of dates between

1650-1500 BC and 1500-1300 BC. Except ceramic material, belonging to Litzen pottery, two more finds of great significance have also been discovered in the stratigraphically reliable context – a Brotlaibidol and an amber bead. These two finds are unique, since they are the only two such items discovered in mainland Croatia. All this supports the fact that the Middle Bronze Age was a dynamic period during which the transfer of ideas and goods took place quickly across the entire territory of the Carpathian Basin, which turned it into a global village!

## 5 FEMALE MOBILITY AND EXOGAMY IN BRONZE AGE COMMUNITIES. A WIDESPREAD PRACTICE?

**Abstract author(s):** Arena, Alberta (Sapienza Università di Roma) - Cavazzuti, Claudio (Università degli Studi di Bologna; Museo delle Civiltà, Roma)

**Abstract format:** Oral

Recent studies in Southern Germany, in the Carpathian basin and in Italy have repeatedly documented the differential mobility between males and females among Bronze Age communities. The major frequency of non-indigenous women has been interpreted as the result of exogamic practices, which were functional to patrilocal systems to establish or consolidate political alliances and/or exchange networks.

The methodological advances in isotope and aDNA analyses are having a crucial role in retracing individual life histories and the identification of ‘non-local’ women. However, considering the methodological limitations for the identification of the ‘provenance’, the radius and the directionality of mobility might be unclear.

In our talk, we will present a synthesis of three case studies from Middle and Late Bronze Age key-sites in Italy, where the integration between an artefact-based approach (distribution of types and technological transfer) and strontium/oxygen isotope analyses has allowed to investigate mobility in the geographical and socio-political context.

At Fondo Paviani and Casinalbo cemeteries (Terramare culture, Po plain) isotopic evidence shows a significant presence of non-indigenous female individuals. At Fondo Paviani we observe that non-local status of the females could be also emphasized by the position and orientation of the body in the burial. At Casinalbo non-indigenous women are more frequent among those who are accompanied with bronze pins. The types of pins might also indicate different origins, not only from the hinterland but also from trans-alpine areas.

At Trinitapoli (Northern Apulia) the considerable quantity of spectacle spirals - a typical female ornament of the eastern coast of the Adriatic – might indicate that women played an important role in the relationships between the two coasts and that exogamy represented a fundamental aspect in the alliance dynamics connecting the Balkans and the Italian peninsula.

## 6 SOCIAL INTERACTION AND MOBILITY AT THE DAWN OF THE URNFIELD CULTURE IN THE SOUTH-EASTERN ALPINE REGION

**Abstract author(s):** Škvor Jernejcic, Brina (University of Ljubljana)

**Abstract format:** Oral

At the beginning of the Late Bronze Age (Bd D) many novelties and innovations spread across Europe. Among them is the prevalence of cremation burials over inhumations. Recent archaeological studies showed that the earliest cremations from the south-eastern Alpine region can be placed in the Middle Bronze Age period (Br B2/C1). Surprisingly, the best analogies for the urns from these cremations can be found in the northern Carpathian Basin territory, which shows a long-standing tradition of cremation burial. Such astonishing correspondences in the pottery between two distant areas indicate that the very area of the Upper Tisza river, together with the territory of the Piliny culture, played a crucial role in the transmission of new burial practices, not only to Slovenia, but also across wider areas along the Sava and Drava rivers on the territory of the so-called Virovitica group. Such a transfer was possible only with direct social interaction connected with mobility or even migrations, which, however, have been maintained also in the beginning of the Late Bronze Age, above all in the Br D, but partly also in the Ha A period, as is indicated by the newest analysis on pottery and bronze objects from the Ljubljana cemetery in central Slovenia.

## 7 NETWORKING AT THE BEGINNING OF THE LATE BRONZE AGE IN THE SOUTHWESTERN CARPATHIAN BASIN

**Abstract author(s):** Ložnjak Dizdar, Daria (Institute of Archaeology, Zagreb)

**Abstract format:** Oral

The beginning of the Late Bronze Age in the southwestern Carpathian Basin is one of the least researched phases of the Late Bronze Age. The transition from the Middle to Late Bronze Age is unclear. There are the open issues of continuity and discontinuity of settlements and cemeteries, which have a material culture that shows a strong tradition related to the western Carpathian Basin and the Adriatic sphere.

This paper will examine the communication networks that can be read from the ceramic style, the rare metal finds, but also the burial method, in the examples of the explored settlements and cemeteries from the beginning of the Late Bronze Age in the territory between the Drava and the Adriatic Sea. There is the open question of aligning the absolute regional chronologies by radiometric dating with the material culture, which is the basis for researching exchange networks in a specific time period.

The example of contemporary settlements and cemeteries dated by radiometric dating and comparative typochronological analysis will be used to try to shed light on the period from the end of the 15th century BC to the 14th century BC in southwest Pannonia.



8

METAL EXCHANGE NETWORKS DURING THE BRONZE AGE IN THE BALKANS

**Abstract author(s):** Gavranovic, Mario (Institute for Oriental and European Archaeology, Austrian Academy of Sciences) - Mehofer, Mathias (VIAS, University of Vienna)

**Abstract format:** Oral

Within a currently running research project, which focuses on a diachronic overview on the metal production, consumption and exchange among Bronze Age societies in the area of western and central Balkan, it was possible to conduct a large series of up to 700 trace element and lead isotope analyses of ingots, slags and finished metal objects (FWF project no. P 32095, New insights in Bronze Age metal producing societies). By combing archaeological criteria in terms of typology, chronology and distribution with the analytical results, it becomes apparent that during the Bronze Age several local and regional metallurgical networks exited in this area. Clearly to distinguish are several objects (e.g. Mycenaean swords) with a composition that do not relate to any of the analytical clusters assigned to Balkans. This point to the conclusion that they can be identified as imported objects of non-local origin. Further interesting is a comparison of analytic data with the archaeological finds pointing to a significant increase of bronze casting activities in the advanced stages of Late Bronze Age (11th – 9th century BCE). The strong development of regional bronze metallurgy during this period appears to be associated with a common technological background.

a.

PROVENANCE, TECHNOLOGY AND POSSIBLE FUNCTION OF GÀTA-WIESELBURG VESSELS FROM FRIULI VENEZIA GIULIA (NORTH-EASTERN ITALY)

**Abstract author(s):** Leghissa, Elena (ZRC SAZU, Institute of Archaeology) - Roffet-Salque, Melanie (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Kiss, Viktória (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences) - De Min, Angelo (Department of Mathematics and Geosciences, University of Trieste) - Visentini, Paola (Friulian Museum of Natural History; Archaeological Museum, Udine Civic Museums) - Prokop, David (CEITEC-Central European Institute of Technology; Brno University of Technology, Institute of Physical Engineering) - Montagnari Kokelj, Manuela (Department of Humanities, University of Trieste) - Bernardini, Federico (Centro Fermi, Museo Storico della Fisica e Centro di Studi e Ricerche; Multidisciplinary Laboratory, The “Abdus Salam” International Centre for Theoretical Physics)

**Abstract format:** Poster

A few sparse vessels typologically attributed to the Gàta-Wieselburg Culture are known from Friuli Venezia Giulia region in north-eastern Italy. Such Culture developed between nowadays western Austria and Hungary during the Early-Middle Bronze Age (Reinecke Br A1b and A2, 2100–1700/1600 BC). Single artefacts, generally biconical double-handled jugs with well burnished surfaces, were discovered in caves of the Trieste Karst (Ciclami, Tartaruga, Teresiana and Ossa) and the Natisone valley (Velika jama). Most of them and a similar vessel from a Gàta-Wieselburg site in Hungary (Bük) have been investigated using several destructive and non-destructive techniques. X-ray computed micro-tomography, portable X-ray fluorescence, optical microscopy and absorbed lipid residue analyses by gas chromatography-mass spectrometry have been applied in order to study their vessel-forming technique, provenance and probable use. According to the preliminary results the Karst vessels were probably imported and the identification of rather uncommon lipids, whose precise identification is still ongoing, opens interesting questions about their possible function.

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AIN’T NO REST FOR THE WICKED: CURRENT STATE AND PROSPECTS IN THE STUDY OF ‘DEVIANT’ BURIAL PRACTICES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Parvanov, Petar (Department of Medieval Studies, Central European University, Budapest/Vienna) - Vargha, Maria (Digital Humanities Unit, Institute for History, University of Vienna)

**Format:** Discussion session (with formal abstracts)

In the last decade archaeology has reappraised the study of rare, highly individualized and unusual mortuary finds commonly referred to as atypical or deviant burials. Research on medieval funerary customs has been particularly active in this exploit, although the phenomenon is by far not limited to this period. The growing number of new discoveries around Europe opens up the possibilities for more interdisciplinary and elaborate examinations, while their outstanding nature urges archaeologists to find analogies outside their immediate background. As a result, the deviant burials create a discourse that arguably for very first time in the discipline is truly glocal in its analytical efforts.

This roundtable aims at recapitulating on the current debate and hopes to identify a way forward. Despite the increase of attention to the topic, there is still lack of consensus on some of its core issues. The situation is exemplified by the uneasiness around terminological preferences or the applicability of ethnographic accounts in explaining the phenomenon, especially in older interpretative frameworks. Establishing direct and more structured environment for evidence-based discussion will greatly assist any advancements in this respect. When available, participants will be strongly encouraged to introduce and consider newly obtained data, including via supplementary poster presentations. Moreover, the discussion shall emphasize on how the theoretical and methodological achievements or problems set by the deviant burials could inform other aspects of archaeological thinking, either chronologic or thematic.

ABSTRACTS

1

BETWEEN BELIEF AND FEAR - REINTERPRETING DEVIANT PRONE BURIALS DURING THE MIDDLE AGES AND EARLY MODERN PERIOD IN GERMAN-SPEAKING EUROPE

**Abstract author(s):** Alterauge, Amelie (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern; Institute of Pre- and Protohistory and Near Eastern Archaeology, University of Heidelberg) - Meier, Thomas (Institute of Pre- and Protohistory and Near Eastern Archaeology, University of Heidelberg) - Jungklaus, Bettina (Anthropologie-Büro Jungklaus, Berlin) - Milella, Marco - Lösch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern)

**Abstract format:** Oral

Prone burials are among the most distinctive phenomena of deviant burials during the Middle Ages and early modern period. However, a comprehensive analysis of these findings is still lacking for German-speaking Europe. By compiling the available evidence from Germany, Switzerland and Austria, this study investigates how prone burials fit into the scope of medieval funerary practices. A sample of 95 prone burials from 60 sites was analyzed regarding burial location, orientation, grave goods, dating, body position, age-at-death and sex. Descriptive statistics were accompanied by a multiple correspondence analysis, performed in order to highlight possible multivariate patterns in the dataset.

Prone burials occur in funerary and non-funerary contexts, with a predominance of single churchyard burials, followed by favored (e.g. church interior) and exterior location as well as settlements. In terms of orientation and furnishing, the majority of churchyard burials do not differ from regular medieval graves. Multivariate patterns appear mostly to be the result of diachronic differences in normative burial practices. A significant correlation was found between burial location and dating, due to a higher frequency of high-medieval prone males in favored locations. In the latter case, prone position is interpreted as a sign of humility and devotion, while similar evidences from late and post-medieval times are seen as an expression of deviancy. Apparent lack of care during burial reveals disrespect and possible social exclusion of the deceased, with inhumations outside consecrated ground being the ultimate punishment. In some regions, apotropaic practices suggest that corpses should be prevented from returning to the living. We hypothesize that the increase of prone burials towards the late and post-medieval period is linked to an apotropaic practice triggered by the spread of epidemic diseases (e.g., plague).

The multiplicity of meanings of prone position in different contexts demands for careful interpretations within the same geo-chronological frame.

2

POST-MEDIEVAL DEVIANT BURIALS IN SILESIA, POLAND

**Abstract author(s):** Duma, Pawel (Institute of Archaeology University of Wroclaw)

**Abstract format:** Oral

Silesia saw the development of a specific system of beliefs that was inseparably associated with the changes which had taken place in the region since the 13th century. An unique ethnic background and subsequent dynamics of historical events led to the formation of a set of ideas and customs, strongly reflected in the sphere of funerary rites drawing both from Slavic traditions and from Germanic and German beliefs introduced by colonists who migrated into the region. I would like to discuss specific groups of people: unbaptised children, women who died in childbirth, suicides, convicts and those who perished in epidemics, who were refused an honorary burial in consecrated land or had ceremonies conducted on special terms. I will also present the places where the bodies of excluded individuals were interred and the reasons behind such treatment of the dead and the evolution of these practices in time. The paper will be supplemented by an analysis of the results of archaeological research, which mainly involved fieldwork carried out at former execution sites.

a.

THE DEVIANT DEAD?: THEORETICAL AND METHODOLOGICAL APPROACHES TO THE BIOARCHAEOLOGICAL ANALYSIS OF DECAPITATION BURIALS IN LATE WESTERN ROMAN BRITAIN

**Abstract author(s):** Christie, Shaheen (University of Wisconsin-Milwaukee)

**Abstract format:** Poster

Archaeological studies focused on the mortuary practices of past societies draw on many lines of evidence to build a framework of the process of death for the majority of the population – these burials are often deemed to be a part of the “normative” burial trend. Burials with characteristics outside of the normative trend, usually by a specified degree, have been deemed “deviant” in previous literature. However, the application of this term has been critiqued and debated in previous scholarship over the past 25 years due to its negative implications and heuristic limitations outside of contextual approaches and multi-disciplinary studies. Recent investigations into Late Roman period (3rd – 5th century A.D.) decapitation burials in Britain have shown these burials reflect diverse uses of the rite both pre- and post-mortem on individuals of all ages, sex, origin, health and stature for diverse reasons (infanticide, judicial execution, trophy taking, fear of the dead, veneration, or an “outsider” social status) as part of a sub-class of mortuary treatment meant to potentially express communal membership. This project aims to explore the intersection of violence, death, bodies, and memory by presenting a contextual bioarchaeological and mortuary analysis of 117 total inhumation decapitation burials from 42 sites in western Roman Britain during the Late Roman Period (3rd – 5th cent. AD). It is hoped by utilizing a systemic approach to this analysis that the results will reveal whether there is evidence to suggest communities utilized specialized mortuary rituals toward

decapitated individuals, whether those practices may be classified as normative, atypical, or deviant, and whether those bodies were used as objects to culturally construct expressions of communal identity or threads of structural violence in Late Romano-British society.

380	<p><b>OVER THE HILLS AND FAR AWAY: CONNECTIVITY WITHIN AND ACROSS MOUNTAINOUS REGIONS IN THE BALKAN EARLY NEOLITHIC</b></p> <p><b>Theme:</b> 1. Networks, networking, communication: archaeology of interactions</p> <p><b>Organisers:</b> Dzhanezhova, Tanya (University of Oxford) - Grębska-Kulow, Małgorzata (Regional Historical Museum - Blagoevgrad)</p> <p><b>Format:</b> Regular session</p> <p>This session aims to stimulate a discussion on the theoretical and methodological premises for the understanding of connectivity dynamics and directionalities within and across high-terrain regions that are usually regarded as natural boundaries. The web of interactions underlying past societies and the trigger for these networks to emerge will be considered within Neolithization context but also in close relation with the landscape and the raw materials procurement strategies.</p> <p>Many highland regions are acknowledged as communication routes mainly because of the large river valleys crossing the mountains. Here, it is also the smaller mountain passes that will be regarded as network hotspots of key importance. How we detect the evidence for communication between various Early Neolithic groups of people and what were the reasons for such connections/dispersal will thus be discussed on broader (interregional) and smaller scale (local highland terrain).</p> <p>Were mountains opened for expeditions? Was the exploration of the highland regions, rich in various raw materials, a consequence or a reason for dispersal and migrations? How far did people go in reaching unknown ‘impassable’ territories and what made them settle new lands? How was the connection with their places of origin kept active? Subsistence patterns and various technologies raw materials procurement – among the key factors to investigate the possible trigger for communication and dispersal – will be considered to approach such questions.</p> <p>We welcome papers concerned with the communication routes and connectivity in mountainous regions that explore any technology and coeval productions based on various raw-materials (clay, flint, bone, etc.), as well as such focused on land use and subsistence patterns.</p>
1	<p><b>CONNECTIVITY OR DIVERSITY? ILINDENTSI AND BREZHANI-ON THE TWO SIDES OF THE KRESNA GORGE, THE MIDDLE STRUMA VALLEY, SOUTHWESTERN BULGARIA</b></p> <p><b>Abstract author(s):</b> Kulow, Małgorzata (Regional Museum of History-Blagoevgrad) - Vieugue, Julien (CNRS, Paris Nanterre)</p> <p><b>Abstract format:</b> Oral</p> <p>The two early Neolithic sites Ilindentsi and Brezhani are located on both sides of the Kresna Gorge in Struma Valley, South-Western Bulgaria. The Kresna Gorge is the longest (16 km) and the narrowest passage along the Struma River valley, which is a natural climatic and ecological barrier dividing the Mediterranean areas and the Central Balkans. Do these circumstances affect the cultural patterns in the two settlements? Did these two chronologically synchronous sites develop in completely different cultural environments or there is unambiguous evidence proving the contacts between them?</p> <p>In the context of the possible cultural affiliations, the analysis of the pottery and certain architectural patterns reveals rather interesting situation.</p> <p>The pottery from Brezhani is much more oriented to the north, to the area of the Galabnik cultural group but also to the east, the territory of the Karanovo I culture. Ilindentsi, on the other hand, shows a very wide variety of ceramic fabrics and several well-presented styles, documenting the active contacts with various regions. The differences are also noticeable in the architecture. At Brezhani, wattle and is used in the earliest settlement, while in the latter site the technique is based on split poles. At Ilindentsi the situation is completely different, as stone architecture is present but also split in two stakes and poles.</p> <p>All these observations indicate that the Kresna Gorge played a role of a cultural barrier for the spread of the new Neolithic lifestyle in the Struma River Valley.</p>
2	<p><b>WEST-EAST AXIS OF CULTURAL CONTACTS IN SOUTH-WEST BULGARIA DURING THE EARLY NEOLITHIC</b></p> <p><b>Abstract author(s):</b> Kulow, Małgorzata (Regional Museum of History-Blagoevgrad)</p> <p><b>Abstract format:</b> Oral</p> <p>Southwestern Bulgaria is mountainous region and includes the highest mountains on the Balkan Peninsula – the Rila and the Pirin mountains exceeding 2000 m above sea level. It is logical to assume that the Struma River valley, which is the largest in this region – was a natural conduit for the spread of the new Neolithic lifestyle. But was this the actual situation?</p> <p>In the Middle Struma valley, there are only 6 Neolithic settlements, and they date to different stages of the Early Neolithic. The archaeological material from these sites reveals a very complex situation. The theory about the spread of the Early Neolithic culture</p>

along the South-North axis – in other words along the Struma River valley cannot be regarded as proven. The focal region actually shows connections with the territories located to the west (the Vardar River valley) in the very beginning of the Neolithic period, as well as those to the east.

Thus, for example, at the site of Kovachevo, phase Kovachevo Ib, are found special cult objects, the so-called altars with stair-like legs, remarkably similar with those characteristic of the Velushina-Porodin Cultural Group which was spread in Pelagonia. The observed analogies between the Struma River valley and the regions located to the West, are confirmed also by the archaeological materials revealed at the sites of Ilindentsi and Drenkovo located in the Middle Struma Valley.

During the entire Early Neolithic period all natural mountain passes connecting the valleys of the Struma River, the Bregalnitsa River and subsequently of the Vardar River were actively used as communication routes. Thus, it rather is the East-West axis that played major role for the Early Neolithic connectivity in the region of the Middle Struma Valley.

3	<p><b>INTERCONNECTED LANDSCAPES? AN ASSESSMENT OF RIVER VALLEYS AS THE PRIMARY PATHWAYS OF COMMUNICATION DURING THE BALKAN EARLY NEOLITHIC</b></p> <p><b>Abstract author(s):</b> Whitford, Brent (University at Buffalo)</p> <p><b>Abstract format:</b> Oral</p> <p>It has long been argued that the rapid transmission of early agricultural practices during the Balkan Early Neolithic, from Thessaly in the South to the Danube River in the North, was facilitated by the north-south orientation of two major river valleys—namely, the Vardar and Struma River Valleys, located in the East of North Macedonia and in Southwest Bulgaria, respectively. However, by placing emphasis on river valleys as the primary arteries of communication, I argue that two problematic assumptions are made: 1) that river valleys are consistent in terms of their internal connective potential, and 2) that river valleys were indeed the preferred routes of travel during the Balkan Early Neolithic. Alternative routes, such as passing through mountains, are invariably denied as the result of such assumptions. In this paper, I revisit the landscape of the Vardar and Struma Valleys in order to question these two fundamental assumptions. I hypothesize that there is indeed a great deal of interconnectivity between these two river valleys and their respective neighbouring regions. Using Circuitscape, a software package for connectivity analysis, I test my hypothesis and conclude whether the Vardar and Struma Valleys are internally homogenous with regards to their connective potential and whether alternative pathways might also be apparent in the region.</p>
4	<p><b>POINTS OF VIEW: CONNECTIVITY ACROSS MOUNTAINOUS REGIONS REVEALED BY EARLY NEOLITHIC BALKAN POTTERY TECHNOLOGY AND FLINT INDUSTRIES</b></p> <p><b>Abstract author(s):</b> Dzhanezhova, Tanya (University of Oxford) - Gurova, Maria (Bulgarian Academy of Sciences, Sofia)</p> <p><b>Abstract format:</b> Oral</p> <p>Most models of Neolithisation in Southeast Europe focus on single categories of artefact and these often are based on either pottery or lithics. The latter results in biased views on the processes of Neolithisation. In this paper we attempt a multi-proxy analysis, considering specific technological approaches in early Neolithic pottery production and Balkan chipped-stone industries.</p> <p>The emblematic white-on-red painted Early Neolithic Balkan style is approached by examination of specific recipes considered in the context of the available raw-materials. Special attention is given to the sites located on the margins of and in the higher mountainous regions, with focus particularly on the connections established across such natural barriers. On the other hand, the macroblade technology and the use of ‘Balkan flint’ along with its formal toolkits is examined in association with flint provenance and distribution. Potential crossovers between the two technologies are considered in spatial, social and cultural contexts.</p> <p>The amalgam of various technologies and raw materials procurement – as one of the key factors to investigate the possible trigger for communication and dispersal – thus points to the web of interactions of past societies and to the actual directionalities realised across natural boundaries.</p>
5	<p><b>READING THE PATTERNS, TRACING THE PAINT: PAINTED POTTERY TECHNOLOGY REVEALS EARLY NEOLITHIC SOCIAL NETWORKS AND COMMUNICATION ROUTES IN SOUTH-EAST EUROPE</b></p> <p><b>Abstract author(s):</b> Dzhanezhova, Tanya (University of Oxford)</p> <p><b>Abstract format:</b> Oral</p> <p>The emblematic painted ware is characteristic of the Early Neolithic period in Southeast Europe. It has been among the main tools to establish cultural group identity and relative chronologies. However, apart from the suggested stylistic observations, do we use its full potential in revealing the web of interactions underlying past societies? A detailed technological study of painted pottery from a series of Balkan sites examines this question.</p> <p>The chaîne opératoire of this multi-stage complex technology has demonstrated both the conservative traditions and the innovative practical approaches in producing the characteristic painted pottery style (Dzhanezhova et al. 2020). Here, connectivity across high-altitude areas – usually considered as geographical and cultural barriers – is also traced by examining the painted style technological specifics. The question is approached by taking into account the corresponding local geologies, which makes it possible to study the web of interactions and technology transfer within and between the Balkan Neolithic communities.</p> <p>This specific technological point of view enables us to detect network hotspots and interrelations between individual sites or re-</p>



gions that actively maintained multidirectional connections. It augments the scientific set of approaches needed to study complex processes such as Neolithisation. Neolithisation models and suggested trajectories are thus considered from yet another, new perspective based on a key component of Early Neolithic technology, painted pottery production.

This project has received funding from the European Union’s Horizon 2020 research and Innovation programme under the Marie Skłodowska Curie Grant Agreement No 798143.

6 THE EARLY NEOLITHIC SETTLEMENT OF KOPRIVETS - A BRIDGE BETWEEN THE NORTH AND THE SOUTH BALKAN PENINSULA

**Abstract author(s):** Vajsov, Ivan (National Institute of Archaeology and Museum) - Popov, Volodja (Regional Museum of History, Pleven)

**Abstract format:** Oral

The Early Neolithic settlement at Koprivets is located in Central Northern Bulgaria, on the second terrasse of the Baninski Lom River, a tributary of the Rousenski Lom. Two separate Early Neolithic layers are documented at the site, the thickness of each exceeding 1m.

The earlier layer contains very high quality monochrome gray pottery with glossy surface. The materials is strikingly similar to the Late Neolithic Hacilar in Anatolia, and to the monochrome layer at Hoca Cesme, located at the mouth of the Maritza River.

The later Early Neolithic layer contains pottery with red engobe and decorated white painted surface. Different from the typical Karanovo 1, the decorative patterns resemble those found on pottery from Early Neolithic sites in Serbia and Romania. Yet other finds, however, such as specific quadrangular altars, point towards connections with the southern Balkan Peninsula – the regions of the Middle Struma River valley and Pelagonia.

Although the settlement at Koprivets shapes the North Bulgarian Koprivets cultural group, it is also closely associated with the cultural dynamics established to the south of the Stara Planina mountain. Among the major questions here are: which routes were used by the first settlers arriving at Koprivets? How to explain the multilateral connections registered in the two succeeding periods? Was there a single migration event followed by local development or active communication persisted in all directions and throughout all the periods documented at the settlement?

7 THE EARLY NEOLITHIC SETTLEMENT AT DZHULUNITSA (NORTH BULGARIA) AND ITS MULTILATERAL CONNECTIONS

**Abstract author(s):** Elenski, Nedko (Regional Museum of History - Veliko Tarnovo)

**Abstract format:** Oral

The paperis focused on the multilateral cultural interrelations demonstrated by an Early Neolithic site located in Central North Bulgaria. The two early phases of its development reveal archaeological materials indicating that the settlement represents the Earliest Neolithic site investigated in the region of the Yantra and the RusenskiLom River valleys. Dated back to the last quarter of the 7th millennium BC, its artifacts showingcharacteristic local features are found together with imported archaeological materials. This combination reveals the very dynamic interrelations between Dzhulyunitsaand other settlements located in various directions, including such that are placed across mountaineous regions. A series of finds are indicators for long-distance connections, showing close resemblance to components of the Anatolian and the Mesopotamian cultures. The paper will discuss both these trends – the long-distance connections and the characteristic Balkan local features. They will be considered in the context of the Neolithisation – especially the exploration of new territories and the establishment of new communities, taking into account the role of the individuals within the group.

8 PASSING “THE WALL”: EARLY NEOLITHIC ROUTES ACROSS THE STARA PLANINA MOUNTAIN RANGE

**Abstract author(s):** Markov, Dragomir - Markova, Hristina (Museum of History Nova Zagora)

**Abstract format:** Oral

Stara Planina, also known as the Balkan, is an extensive mountain range located in the eastern part of the Balkan Peninsula. Often considered as a natural border and an unfavorable area to be settled by the Neolithic communities, this region is not studied in details. And yet, the characteristics of a series of archaeological sites located in present-day South and North Bulgaria – two areas geographically divided by the Stara Planina range, reveal evidence for cultural connections, suggesting that the mountain was not an impassable barrier. The focus in this paper is on the possible communication or even migration routes in the Early Neolithic, specifically in the eastern part of the Middle Stara Planina mountain. In order to discuss the interrelations between the territories located to the South and to the North of this mountain range, we compare various archaeological materials (pottery, bone and lithic industries, etc.) found in two main clusters of sites dated to the first half of the Early Neolithic period in the country (end of 7th – beginning of 6th millennium). The first includes settlements located to the North of the mountain – Dzhulyunitsa-Smardesh, Belyakovets-Plochite, Samovodene and others, whereas the second consists of South Bulgarian sites, among which the tells Karanovo, Azmashka mogila and Nauchene. As there are no easily passable ravines in this part of the mountain, we also use ethnographic data. The latter, combined with the new archaeological investigations in the region suggests that at least three passages were actively exploited in the eastern zone of the Central Stara Planina.

9 THE USE OF OCHRE AND THE PROCESS OF NEOLITHISATION OF SOUTHEAST EUROPE

**Abstract author(s):** Kosciuk-Zalupka, Julia (Jagiellonian University, Cracow)

**Abstract format:** Oral

There has been intensive discussions associated with the characterization of „Neolithisation process” and, correspondingly, many attempts to categorize prehistoric periods by using definitions such as „the Neolithic package” or „agricultural package” within the „Neolithic revolution”. Yet, a more detailed review indicates that many cultural phenomena remain far from being studied and understood by traditional approaches. Some more specific components of the material culture do not attract the attention, characteristic for the more usual categories of finds. Such example is the use of ochre which usually is omitted in scientific discussions. A more thorough study of this mineral pigment actually reveals some specific patterns of usage, as well as changing cultural “meaning”.

My four-years project has revealed a whole spectrum of ochre applications. The vast focal territory is especially favorable for broader comparisons. The study of both the Mesolithic and the Neolithic contexts from the Levant to the Carpathian Basin that contain ochre has revealed certain modifications of its use. Here, the attention is especially towards the exploitation of the ochre, the mean distances to the ochre raw-materials and the possible exchange practices of the societies living closer to the sources.

This paper is focused on the Early Neolithic sites containing such information from what is nowadays Romania and Serbia and these will be considered within the broader context of the Neolithisation, starting with the area of the Levant.

10 GOING FORWARD, LOOKING BACK: EARLY NEOLITHIC RAW MATERIAL PROCUREMENT AND FORMATION OF COMMUNICATION ROUTS BETWEEN THE BALKANS AND CARPATHIAN BASIN

**Abstract author(s):** Botic, Katarina (Institute of Archaeology, Zagreb)

**Abstract format:** Oral

In the early Neolithic, locating good sources of raw material such as flint and clay was essential for daily life. Settlements of Starčevo population formed on river terraces, slight elevations near small watercourses or the edges of marshlands in that period are well documented (Minichreiter 2010). However, settlements on large clay deposits or in their vicinity were also located in modern times thanks to clay extraction processes, such as Starčevo (Arandelović-Garašanin 1954), Slavonski Brod – Galovo (Minichreiter 2007), Našice – Ciglana (Dimitrijević 1974; Marković et al. 2016), several positions at Đakovo (Hršak 2010; Đukić 2014a), Podgorač (Marković 1971; 2002; Minichreiter 1992; Marković et al. 2016) etc. This settlement pattern would suggest specific strategy further underlined by the presence of numerous pottery kilns especially at Galovo near Slavonski Brod site. At this site, situated close to Sava river, large amounts of flint and cores were found, again suggesting a centre of lithic production and distribution of raw material (Šošić Klindžić et al. 2018). Recent research regarding the position of deposits of raw material used at this site suggests that it partially came from the area between Doboj, Maglaj and Gračanica in northern Bosnia (Šošić Klindžić et al. 2018). This area is relatively close to Gornja Tuzla salt deposits easily reachable through Spreča river valley and it is connected by Bosna river with the Sava river valley sites to the north as well as Obre site near Sarajevo in the south. Further connection with the Balkans can be seen in the presence of domesticated pigs at Galovo and Zadubravlje sites from the earliest settlement phases, which is in contrast to the northern Balkan region and the rest of the Carpathian basin (Ethier et al. 2017).

380 OVER THE HILLS AND FAR AWAY: CONNECTIVITY WITHIN AND ACROSS MOUNTAINOUS REGIONS IN THE BALKAN EARLY NEOLITHIC

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Dzhanfezova, Tanya (University of Oxford) - Grębska-Kulow, Malgorzata (Regional Historical Museum - Blagoevgrad)

**Format:** Regular session

This session aims to stimulate a discussion on the theoretical and methodological premises for the understanding of connectivity dynamics and directionalities within and across high-terrain regions that are usually regarded as natural boundaries. The web of interactions underlying past societies and the trigger for these networks to emerge will be considered within Neolithization context but also in close relation with the landscape and the raw materials procurement strategies.

Many highland regions are acknowledged as communication routes mainly because of the large river valleys crossing the mountains. Here, it is also the smaller mountain passes that will be regarded as network hotspots of key importance. How we detect the evidence for communication between various Early Neolithic groups of people and what were the reasons for such connections/ dispersal will thus be discussed on broader (interregional) and smaller scale (local highland terrain).

Were mountains opened for expeditions? Was the exploration of the highland regions, rich in various raw materials, a consequence or a reason for dispersal and migrations? How far did people go in reaching unknown ‘impassable’ territories and what made them settle new lands? How was the connection with their places of origin kept active? Subsistence patterns and various technologies raw materials procurement – among the key factors to investigate the possible trigger for communication and dispersal – will be considered to approach such questions.

We welcome papers concerned with the communication routes and connectivity in mountainous regions that explore any technology and coeval productions based on various raw-materials (clay, flint, bone, etc.), as well as such focused on land use and subsistence patterns.



ABSTRACTS

a. THE EARLY NEOLITHIC SETTLEMENT AT KOPRIVETS AND THE FIRST FARMERS IN CENTRAL NORTHERN BULGARIA

**Abstract author(s):** Popov, Volodya (Regional Museum of History-Pleven)

**Abstract format:** Poster

The Early Neolithic settlement at Koprivets is located in the Baninski Lom River valley, a tributary of the Rusenski Lom, in the region of Russe, Bulgaria. According to its dating towards the end of the 7th millennium BC, Koprivets is one of the earliest Early Neolithic settlements in the Eastern Balkans that contain monochrome and later white-painted pottery. Although it is located in North Bulgaria and away from the major Southern Early Neolithic settlement networks, the high quality of the Koprivets earliest pottery equals that of the ‘monochrome’ ware produced in Thessaly, along the North Aegean coast and even in Anatolia. The challenge is to explain these similarities. Where the first inhabitants of Koprivets came from? Was Stara Planina an impassable barrier or there were other Neolithisation routes?

Another major question refers to the observation that the Koprivets white-painted ‘Northern’ Balkan style is dissimilar from the wide-spread South Bulgarian Karanovo white-painted style. The difference between the two may be due to the different chronologies, i.e. if we assume that the two settlements phases that correspond to these styles are not contemporaneous. However, if synchronous, the two white-painted styles would imply that the Balkan Mountains appeared as a serious communication/dispersal barrier between the two Balkan regions in the Early Neolithic.

The continuous development of the Early Neolithic settlement endured 150 years. After that time the site was abandoned and the reasons for this event are yet to be investigated. Only towards the end of the 6th millennium a new, Late Neolithic settlement was established in the same area.

381 ARCHAEOLOGY DAYS ACROSS EUROPE: SHARING ARCHAEOLOGICAL HERITAGE

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Ratier, Pascal (Inrap) - Berkelbach, Janneke (Stichting Nationale Archeologiedagen)

**Format:** Discussion session (with formal abstracts)

Archaeological heritage represents a major societal challenge for Europe, whether in terms of protection, conservation, public awareness or education. It was in this spirit that the National Archaeology Days were created in France 10 years ago, in response to strong demand from stakeholders and the public alike. Organised by the Institut national de recherches archéologiques préventives (Inrap), the 10th National Archaeology Days (JNA) took place in France from Friday 14 to Sunday 16 June 2019. The Archaeology Days are devoted to the diffusion of research, collections and archaeological heritage, “from the excavation to the museum”.

For the first time, on this anniversary edition, the JNAs opened up to European participation: 18 participating countries, 1,160 locations, including fourteen UNESCO World Heritage Sites. One of the objectives of this event is to attract new audiences through events of “proximity”. Archaeology Days organisers have proposed all kinds of activities that can present “archaeology-in-the-making” and bring European citizens to get to know and question their past.

In this proposed EAA session, speakers will be invited to present various events unfolding in different European countries and show how Archaeology days can contribute to the sharing of cultural heritage at European level, in a way that constitutes an instrument of cohesion while preserving the cultural identity of each and all involved. Further questions which speakers are invited to address include :

- How can these Archaeology Days be used to acquaint European citizens with the entire archaeological process, concerning both the production of knowledge and the management of the past?
- How can we make these days a genuinely European event in spite of the diversity of archaeology practices and policies across the countries of Europe?
- Lastly, the audience will launch a debate on the ways to expand and enrich this European Archaeology Day.

ABSTRACTS

1 A WAY TO DEVELOP THE EUROPEAN ARCHEOLOGY DAYS (EADS)

**Abstract author(s):** Ratier, Pascal (INRAP - National Institute for Preventive Archaeological Research)

**Abstract format:** Oral

In 2020, the EADs had their second edition with great success. How can EADs be developed by making an event into a venue where the public can meet with the entire archaeology operating chain? The event can only find its audience through the crossover of a national communication, driven by a national and public actor, as well as the one elaborated by the local organizers towards their usual networks. Another of the fundamental missions at the national level is to mobilize all the archaeological actors of the territory, “from the excavation to the museum”, so that the public can have access to the diversity of the whole archaeology operating chain. So it is essential that the national authorities managing archaeology in each European country should be able to coordinate the event on

their territory, in order to integrate it into their overall policy for the sharing of the archaeological heritage. The creation of a network of organizers coordinated at the national level in each country is therefore an essential issue for future editions.

2 ARCHAEOLOGY DAYS NETHERLANDS, ENGAGING AND CONNECTING A NEW AUDIENCE BY BUILDING UP & INSPIRING A NETWORK OF 300 PARTNERS

**Abstract author(s):** Berkelbach, Janneke (Nationale Archeologiedagen)

**Abstract format:** Oral

The foundation ‘National Archeology Days’ in the Netherlands has been organizing National Archeology Days since 5 years. The main goal of the National Archaeology Days is the public outreach of archaeology in the Netherlands. We are dedicated to make Dutch archaeology accessible and interesting for a wide and diverse audience.

The archaeology days are three days in the year in which the general public can experience all the aspects that make archaeology interesting and fun. The days bring the past to life and offer a unique opportunity for the public to see what is and was hidden in the Dutch soil.

Everybody who is involved in Dutch archaeology, from museums to volunteer organizations is invited to open their doors and taking the public with them into the wondrous world of archaeology. From workshops in pottery determination to participating in real excavations and from archaeological hiking trips to plays and lectures.

The presentation will reflect on how we have built up a network of over 300 organizations in the Netherlands to develop and organize the days; the role of archaeological volunteers in the Netherlands and how to inspire partners by sharing best practices: examples of inspiring public activities involving archaeology, often realized in close cooperation with other cultural disciplines, such as fashion, technology, arts & crafts and design.

3 EMPOWERING THE PUBLIC THROUGH THE CBA FESTIVAL OF ARCHAEOLOGY

**Abstract author(s):** Corkill, Claire (Council for British Archaeology)

**Abstract format:** Oral

Over the last 30 years the Council for British Archaeology (CBA) has coordinated the UK wide Festival of Archaeology. This two-week event provides 100s of opportunities for the public to get involved in archaeology through a diverse mix of events delivered by a range of organisations and voluntary groups.

By offering opportunities to move beyond traditional archaeological narratives the Festival of Archaeology hopes to educate and empower the public using archaeology as a tool to engage audiences with contemporary social issues such as climate change, identity and changing political climates. Archaeology naturally creates opportunities to reflect on past and current societal challenges, encouraging debate and inspiring change for the future. The Festival of Archaeology has the potential to facilitate this change through the development of events and activities that excite audiences and encourage dialogue.

This paper will reflect on some past successes of the Festival and look at how this model is evolving to enable greater, more dynamic relationships with audiences in the future.

386 THE CROSS-CULTURAL CROSSBAR/ MUSIC AND THE HIGH CS

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Romero Mayorga, Claudina (Ure Museum of Greek Archaeology; University of Reading) - Lloyd, James (University of Reading) - Bellia, Angela (Institute for Archaeological and Monumental Heritage, Rome; Archaeomusicology Interest Group of the Archaeological Institute of America - AMIG)

**Format:** Regular session

This session explores the idea of music in Antiquity as a method of cross-country cultural communication. The process of creating and playing music suggests that these activities were learnt and transmitted through transgenerational interaction, implying the need of an audience and hence, encouraged social synergy. Music is, after all, a system of communication that linked peoples from different backgrounds. When viewed from this perspective, music is a distinctly local phenomenon, with music helping to delineate shared identities and beliefs.

However, the ancient Greek poet Pindar spoke of song travelling out on ships, and we know that not just songs, but musicians too, travelled out on ships, living highly mobile lives. In this sense, music was a highly cross-cultural phenomenon. This panel argues that viewing music as an invisible commodity will improve our understanding of ancient trade and travel more broadly, by analysing musical iconography, surviving instruments, sound tools and epigraphy. This panel encourages interdisciplinary approaches to the study of ancient musical networks.

This dichotomy of materiality (realia) and immateriality (sound) will allow us to pinpoint networks, sporadic contacts and shared mechanisms of musical activities maintained by different social groups from across the broad period of the global Iron Age (very roughly 12th century BCE – 4th century CE).

We encourage papers on topics such as, but not limited to:

- Representation of ritual music
- Musical networks
- Organological comparisons and studies
- Visual media analysis: musical iconography
- Methodological approaches to study musical networks
- Music as a commodity.

ABSTRACTS

1 MUSIC NETWORKS AND PERCUSSIVE AESTHETICS IN IRON AGE AEGEAN

**Abstract author(s):** Kolotourou, Katerina (Independent researcher)

**Abstract format:** Oral

‘When music changes, the state changes with it’ (Damon of Oa, fr. 37B 10 D-K)

The increased material and iconographic evidence for the use of percussion instruments in funerary and ritual contexts documents one of the most profound performative developments that took place in the Aegean during the Early Iron Age. In the centuries following the collapse of the Mycenaean palatial system, especially from the 8th century BC onward, different percussive devices such as rattles, bells, cymbals, clappers and frame drums, mirror the instrumental varieties that feature in earlier and contemporary Egyptian, Mesopotamian and Levantine musical traditions. Such prominently percussive musical landscape is in sharp contrast with the limited Aegean Bronze Age percussive repertoire comprising a handful of Minoan seistra, clappers, and a unique Mycenaean rattle representation.

This paper argues that the increasing implementation of percussive performance practices in Iron Age Aegean is a complex process closely related with internal social negotiations and dynamics. As such, the newly acquired percussive corpus did not appear as a single monolithic entity, and each instrumental/performative variety has its own ‘story’ in becoming part of the Greek musical life. The question that arises is: what important meanings were thus communicated within the Greek socio-cultural milieu? This paper will address this question taking as a case study the evidence for the use of rattles in funerary ritual.

2 FORMS OF REGIONAL MUSIC IN ARCHAIC GREECE: EVIDENCE AND METHODS

**Abstract author(s):** Lloyd, James (University of Reading)

**Abstract format:** Oral

Modern analysis of ancient Greek music has benefited greatly from iconographic studies, but with few exceptions these studies have focused on understanding the images of Attic and South Italian figural pottery (c.6-4th BCE). Despite this, developments in the study of regional Archaic Greek pottery have shown the influence of local traditions in creating iconographic schema within a wider pan-Hellenic visual vocabulary. However, both fields have developed largely independently from studies on ancient networks, with the way that music travelled being relatively under-explored.

This paper bridges these areas of study by providing a comparative analysis of the iconography of regional black-figure pottery productions, from the female choruses in Clazomenian pottery and the religious processions in Boeotian, to representations of musicians in Euboean, Laconian, Corinthian, East Greek and more. By viewing these iconographies as part of a pan-Hellenic tradition, but also in reference to local attitudes to object and image, regional Greek black-figure pottery shows us a subtly variegated palette of musical styles, customs, and influences that reflect the specific socio-geopolitical circumstances of their place of manufacture.

Having explored and mapped these regional differences, the paper then raises a methodological question. We know that regional pottery productions were popular items of trade, and because of this are useful sources for the reconstruction of ancient socio-economic networks – to what extent might these vases also serve to delineate routes of musical exchange, where previously we have relied on literary sources?

By exploring the iconography of regional Greek black-figure pottery, we can better understand the variegated nature of ancient Greek music, the shared features which unified it, and the local traditions which differentiated it.

3 DEPICTION OF RITUAL MUSIC INSTRUMENT AS EVIDENCE FOR MOVING VASE PAINTERS

**Abstract author(s):** Vandlik, Katalin (Eötvös Loránd University)

**Abstract format:** Oral

Through the stylistic study of two South Italian red figured vases, recently purchased by the Hungarian Museum of Fine Arts, we can illustrate the influence of Sicilian vase painters on the early workshops of Paestan red figured vases. It is especially true in the case of Asteas, whom one of the vases is attributed to. The vase in question represents a Dionysian scene, and Dionysos is wearing a little bell on his wrist. The bell is not a typical feature on the other South Italian, nor on the Attic representations of Dionysos, we find it almost exclusively on the vases of Asteas and the Painter of Louvre K240, who started his career in Sicily. Some of the vases of the latest artist comes from Lipari, where little bronze bells have been found in tombs also. These facts enable the study of relocation of vase painters, as well as that of the regional differences of the Dionysian rituals.

4 THE APULIAN RECTANGULAR CITHARA: FROM PHOENICIA TO TARENTUM

**Abstract author(s):** Vergara Cerqueira, Fábio (Universidade Federal de Pelotas; Institut für Klassische Archäologie - Universität Heidelberg; Centre Jean Bérard - Naples; Humboldt-Foundation; Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq Brasil - Pesquisador PQ1d)

**Abstract format:** Oral

From late 5th to early 3rd century, the city of Taras in Southeast Italy, originally a Greek colony founded by Spartans at the end of the 8th century, was an important production center of painted pottery in Greek tradition, the so-called Apulian vases, produced in red-figured and Gnathian techniques. Such vases carried singular iconographical repertoires with musical interest, namely with representations of musical instruments. Through a systematic cataloging with about eighty vases, it was possible to individualize iconographically a specific shape of string instrument, generically called rectangular cithara, which we propose here to define more specifically as “Apulian cithara”, based on the archaeological evidence of images recorded in vase-painting and in coroplastics. The compared iconographical study indicates that the rectangular frame, with flat base, is not typical for the sounding board of Aegean stringed instruments tradition, but for the Oriental one, as showed by Phoenician, Assyrian and Hittite figured monuments. Considering iconography and the philological testimonies regarding Greek musical instruments denomination, we will propose that the Apulian rectangular cithara is a local and exquisite development of an instrument which origin is in Phoenicia. An instrument that probably belonged to the same family as the phoenix, denomination mentioned from Alcaeus, in late sixth century B.C., until Pollux, in early third century in Imperial era.

5 RESTORING MUSIC TO ANCIENT CYPRIOTE SANCTUARIES

**Abstract author(s):** Smith, Amy (University of Reading)

**Abstract format:** Oral

This paper explores the use of music in Archaic Cypriote sanctuaries. Through the use of 3D printed figurines of the Kamelarga type, first as pedagogical tools and then as a means of envisioning the role of music in 3D spaces, we have sought an understanding of the role of both creating and playing music as part of religious observance. While musical sounds are lost from the archaeological record of Cyprus, the votive figurines deposited by visitors to tombs as well as sanctuaries in the thousands testify the importance of music in connection with other votive practice, e.g. sacrifice and other gifts. A careful examination of these gifts to the gods provides important information about the instruments played in the sanctuaries. A study of their forms suggests possible interactions with trans-Mediterranean cultures. Through a study of the forms of their instruments, moreover, one can reconstruct the music that our Kamelarga figurines might have created in combination with eachother. Restoring immaterial sounds to the the materiality of the votive figurines and their instruments allows us to restore the vital medium of music to the sanctuaries where it would have brought diverse audiences in communal worship.

6 MUSIC, NETWORKS AND THE CULT OF APOLLO DELIOS

**Abstract author(s):** Angliker, Erica (University of London, Institute of Classical Studies, Research Associate)

**Abstract format:** Oral

Located at a nodal point on the sea routes connecting west and east, and offering various resources to the traveler with basic needs, Delos was already a great place for networking in the Iron Age as it provided the various nascent poleis with a neutral location at which elites could hold competitions, display wealth and forge alliances. Although its magnificent buildings and statues have brought it fame, the offerings to Apollo that it hosted in antiquity included music and dance. Music was not only a suitable gift for the gods, but also a means of communication between men and was as important for human bonding as were ritual meals. In this paper, I argue that though music was a common offering at any Greek sanctuary, it played a pivotal role in a pan-Hellenic sanctuary such as the one of Delos.

I show that on Delos music served as a factor facilitating communication between people of different linguistic backgrounds thus facilitating networks amongst diverse peoples who came from different parts of the Aegean. I explore how the psychological effects of music paired with dance to produce on the viewers, players and dancers an overwhelming experience that forged bonds between them. Drawing on recent studies in the psychology of religion and music, I explore how music could have been used to manipulate consciousness, generate significant emotional responses, and ensure a potent memory of the event. The memory of this kind of bonding experience is evident in several types of remains from the sanctuaries (vases, musical instruments dedicated to gods) and particularly on Delian coins depicting the lyre, Apollo’s attribute, through which he was associated with music.

7 CONTACTS, ASSOCIATIONS AND CONTAMINATION IN ROMAN MYSTERY CULTS

**Abstract author(s):** Romero Mayorga, Claudina (Ure Museum of Greek Archaeology)

**Abstract format:** Oral

Mystery cults proved to be an attractive alternative to Hades in Roman times. These sets of beliefs entered the Roman Empire in the 1st century BC and continued to be a key religious phenomenon until the 4th century AD. Mystery cults were characterized by a god/goddess of Eastern origin, a secret set of rituals, a strict sacerdotal hierarchy in its community and the promise of salvation in the afterlife (or in this one). The ceremonies usually included processions, chants and performances, especially those associated

with Isis and Cybele.

This proposal will focus on the importance of music in these cults by studying the iconography present in the temples and the recovery of musical instruments in the most important centres of worship. Although ancient sources mention dreadful noises or exotic music (Ambrosiaster in the case of the Mysteries of Mithras; Apuleius in the case of the Mysteries of Isis – amongst others), the soundscape of these religious phenomena remains under-researched. The presence of bells, lyres, cymbals, syrinx, tambourines and sistra might reveal a close interconnection among the different cults, which might include similarities in their soteriology.

8        **SOUNDS AND SOCIAL SYNERGIES IN THE PERFORMATIVE SPACES OF THE PAST**

**Abstract author(s):** Bellia, Angela (National Research Council of Italy)

**Abstract format:** Oral

Research on musical and choral performances in the sacred sphere has provided extensive documentation of human behaviour and commentary on the practices of ritual, relying on images, votive objects, inscriptions, and literary sources, but rarely including much about architectural setting. Indeed, studies of music and dance performances in ritual and religious behaviour only occasionally provide details about space. Moreover, as something that does not tend to leave direct material traces, music and dance are not often considered in archaeological work related to ancient Greek architecture. However, they were important aspects of ancient life that can be investigated using a new approach to the archaeological remains. It seems surprising that important public spaces in antiquity, such as performative spaces, have been investigated almost exclusively with a focus on their visual function as places in which individuals or groups display and experience their collective or personal identities and status. Studying these architectural structures inevitably directs attention to interactions between behaviour and the built environment. Only by acknowledging, investigating, and recognising performative spaces as places based on their physical structures and the way musicians and dancers interacted with their audiences in those structures can we begin to understand how sonic events and ritualised movements performed in these settings of the past contributed to the complex relationship between buildings, spaces and social synergies, taking into account that dance does not contribute to the soundscape of the space, but also to its dancescape.

389        **EARLY AGRICULTURAL COMMUNITIES IN SOUTH-EASTERN EUROPE: NEW DISCOVERIES, INTERPRETATIONS AND MODELS**

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Vitezovic, Selenia (Institute of Archaeology, Belgrade) - Arampatzis, Christoforos (Aristotle University of Thessaloniki) - Rajković, Dragana (Archaeological Museum Osijek)

**Format:** Regular session

The topic of this session are new researches of the Neolithic and Chalcolithic period in the regions of the southern Carpathian Basin, Balkan peninsula and adjacent and related areas. In particular, in the past two decades, archaeological researches changed considerably from various aspects and for various reasons. The period after the wars and political crises in certain countries was the time when scientific researches in different areas got the possibility to advance, including archaeology; numerous large-scale development projects were undertaken in majority of South-European countries (motorway constructions, etc.), providing the opportunity for large-scale rescue excavations. Moreover, changes in theoretical and methodological approaches worldwide inspired initiation of numerous new projects; field survey projects, excavations of newly discovered sites, revision excavations of already known sites and different analyses of previously excavated material, which in turn contributed to numerous new discoveries, and provided novel data regarding diverse aspects of the Neolithic and Chalcolithic communities. There is a large amount of AMS dates now available; archaeobotanical and zooarchaeological studies became common practice and there are numerous scholars in this field, thus providing new data and interpretations regarding chronology, subsistence and economy, etc.

This session aims to bring together archaeologists from with different backgrounds (field archaeologist, specialists in zooarchaeology, etc.) in order to provide a fruitful discussion on the current results and directions on future researches. We would like to invite papers that will present new researches, new data, as well as novel interpretations. Potential themes include, but are not restricted to:

- New AMS dates and new interpretations regarding chronology
- New research in subsistence and economy; novel data from zooarchaeology and archaeobotany
- New research on settlement patterns, land use, contacts, exchange patterns
- Novel data from new discoveries and from large-scale rescue excavations
- Future directions for the study of the Neolithic and Chalcolithic in the region.

**ABSTRACTS**

1        **THE TIMING, TEMPO AND MODE OF THE NEOLITHIC EXPANSION ACROSS THE CENTRAL BALKANS**

**Abstract author(s):** Porcic, Marko (Faculty of Philosophy, University of Belgrade) - Nikolić, Mladen (Faculty of Mathematics, University of Belgrade) - Pendić, Jugoslav - Blagojević, Tamara - Penezić, Kristina - Stefanović, Sofija (BioSense Institute, University of Novi Sad)

**Abstract format:** Oral

The Central Balkans represents an important corridor for the spread of the farming populations from the origins of the European Neolithic in Greece further into the Central Europe. The absolute date of the first appearance of the Central Balkan Early Neolithic Starčevo culture in this region has been established by previous research (based on the relatively low number of radiocarbon dates) to a period after 6200 BC, but the demographic and social specifics as well as the spatio-temporal dynamics of the expansion remain unknown. In this paper we integrate new radiocarbon evidence from the BIRTH project with statistical analysis and mathematical modelling (implemented in computer simulation) in order to answer the following questions about the spread of the Neolithic across the Central Balkan region. 1. When did the Neolithic arrive to the Central Balkans? 2. What was the speed and the spatial pattern of the expansion? 3. What were the demographic features of the first Neolithic populations in terms of fertility and mortality? 4. What was driving the expansion? Our results confirm the previous dating of the Neolithic entry into the Central Balkan area ~6200 BC, pushing it possibly a few decades earlier. The spatio-temporal pattern of the expansion is in line with the Wave of advance model, with the farming front spreading relatively fast and following the north-south axis in general, but with potential evidence for leapfrogging over larger distances. The computer simulation results suggest that the expansion was fueled by very high fertility and low to medium mortality, and that the primary reason for migration was social rather than economic (i.e. due to limitations of environmental carrying capacity).

2        **THE EARLY NEOLITHIC ON THE BAČKA BANK OF TISZA RIVER IN NORTHERN SERBIA**

**Abstract author(s):** Maric, Miroslav (Institute of Balkan Studies, Serbian Academy of Sciences and Arts) - Mirković-Marić, Neda (Međupštinski zavod za zaštitu spomenika kulture Subotica)

**Abstract format:** Oral

In 2017 “The archaeological map of North Bačka area” project was initiated by the Intermunicipal institute for heritage protection Subotica in cooperation with the Institute of Balkan Studies of the Serbian Academy of Sciences and Arts. Over the course of the following three years, more than 500 new archaeological sites were detected through field survey in Kanjiža, Senta and Ada municipalities on the Bačka bank of Tisza River. Among the newly discovered locations, around 30 sites could be determined as being early Neolithic, Körös-Starčevo-Criș period. The preliminary results of the survey give new data on the earliest permanent settlements in this area of north Serbia and illustrate settlement positioning and patterning in the region during the early Neolithic period. The survey data indicates that the Bačka side of Tisza appears to have been less favoured for settling in the early Neolithic, when compared with the opposite Banat area. Although it may be too early to speak with certainty, it appears that the landscape of the north Bačka region, predominantly influenced by sand and loess deposits, may have had a prominent role in the settlement patterning.

3        **NEW INTERPRETATION OF THE MIDDLE AND LATE NEOLITHIC CHRONOLOGY IN THE SAVA-DRAVA-DANUBE INTERFLUVE**

**Abstract author(s):** Botić, Katarina (Institute of Archaeology, Zagreb)

**Abstract format:** Oral

Old middle and late Neolithic periodisation proposed by S. Dimitrijević (1968; 1978; 1979) for the Sava-Drava-Danube interfluve (south-western Carpathian basin) underwent very little change over time. New methodology of excavation and results of post excavation work together with new radiocarbon dates obtained over the last two decades demonstrated the need of combining radiocarbon chronology with archaeological finds in order to solve certain apparent chronological discrepancies. Middle and late Neolithic pottery styles seem to have been more diverse and their relations more complex than previously thought. Presence of central European LBK and emergence of Ražište style around 5400/5350 BC (Marković 1985; 2012; Jákucs et al. 2016; Botić 2018) and its spread southwards in the micro region between Donji Mihaljac, Đakovo and Slavonski Brod was noticed for the first time (Botić 2017; 2018). This micro region was a separation point in late Neolithic as well between Korenovo, Brezovljani and classical Sopot styles (Regenye 2002). Sé and Butmir finds from the eponym Brezovljani site (Marković, Okroša Rožić 2017) and newly confirmed late Vinča presence in the eastern Slavonia (Botić 2019) further stress the complexity of Neolithic connections between the Carpathian basin and the Balkans. New chronologies are proposed for the middle and late Neolithic of the south-western Carpathian basin.

4        **NEW AMS, STABLE ISOTOPE AND GENOMIC DATA ILLUMINATE PREHISTORIC POPULATION DYNAMICS IN OSIJEK-BARANJA COUNTY, CROATIA**

**Abstract author(s):** Freilich, Suzanne (University of Vienna)

**Abstract format:** Oral

Rescue excavations during the construction of a highway in Osijek-Baranja County in northeastern Croatia revealed an archaeo-



logical site at Beli-Manastir Popova Zemlja that contained horizons spanning from the Early Neolithic to post-Roman times. A rich assemblage of artefacts was recovered attesting to a high prehistoric population density. Most of the Neolithic context consists of large pit houses, within which many burials were discovered along the periphery, often of juveniles, and sometimes accompanied by ceramic grave goods. A channel running along the eastern edge of the site, and still in use by village inhabitants during Neolithic times, contained atypical depositions of further individuals.

Diet and mobility were investigated among individuals dating to the Middle Neolithic Sopot culture using carbon, nitrogen and strontium stable isotope analysis to further understand community patterns of social organisation. Differences in dietary practices can be associated with different social status, either ascribed or achieved, and can also be linked to the presence of migrants. The presence of non-local individuals when analysed with strontium indicates if an individual has moved from their place of childhood, and can help elucidate sex-biased mobility and residency patterns. Results of these investigations will be presented together with complementary results regarding the genetic signature of individuals in this community and the relationship to burial context and diet, as well as comparisons to isotope data for the Bronze Age in the same region. Furthermore, new AMS data will be presented which places one individual in the Chalcolithic who exhibits significantly different ancestry to the Middle Neolithic individuals, reflecting widespread population changes at this time.

5 **ARCHAEOLOGICAL RESEARCH IN SOUTHERN BALKAN LAKES: NEW DISCOVERIES AND PRELIMINARY RESULTS**

**Abstract author(s):** Ballmer, Ariane - Hafner, Albert (University of Bern, Institute of Archaeological Sciences; Oeschger Centre for Climate Research OCCR) - Bogaard, Amy (University of Oxford, School of Archaeology) - Kotsakis, Kostas (Aristotle University of Thessaloniki, School of History and Archaeology) - Tinner, Willy (University of Bern, Institute of Plant Sciences; Oeschger Centre for Climate Research OCCR)

**Abstract format:** Oral

In the years 2018–20, a series of archaeological, archaeobotanical and palaeoecological field investigations have been carried out in and around lake shore settlements of the Neolithic and Bronze Ages in the border triangle between Greece, and the Rep. of North Macedonia and Albania. The research is carried out in the framework of the interdisciplinary project ‘Exploring the dynamics and causes of prehistoric land use change in the cradle of European farming’ (EXPLO) (<http://www.exploproject.eu/>), awarded by the European Research Commission with a Synergy Grant. The project is headed by international specialists from the Universities of Bern, Oxford and Thessaloniki.

The paper will present the project’s very first results and most importantly point out the considerable potential of the Southern Balkans lakes region for the archaeology of prehistoric wetland dwellings, the study of early and middle Holocene climatic conditions and human-environment interactions, as well as the lakes’ value in regards to high-resolution chronologies, in particular dendrochronology.

6 **REASSESSING PREHISTORIC LIFEWAYS IN THE LIMASSOL REGION: THE NEOLITHIC AND CHALCOLITHIC CYPRUS PROJECT (NCCP)**

**Abstract author(s):** Voskos, Ioannis (National and Kapodistrian University of Athens) - Kloukinas, Dimitrios (Aristotle University of Thessaloniki) - Georgotas, Anastasios - Marda-Stypsianou, Antonia - Roumpou, Maria - Vika, Efrossini - Mantzourani, Eleni (National and Kapodistrian University of Athens)

**Abstract format:** Oral

Archaeological research in Cyprus developed rapidly during the second quarter of the 20th century, when large-scale scientific projects (e.g. the Swedish Cyprus Expedition) and several excavation campaigns established the existing chronological framework. Although these archaeological programmes were largely based on culture-historical perspectives, their impact on our understanding of prehistoric habitation and socio-economic evolution on the island is significant. On the other hand, the marked advances in archaeological research and methodology during the last 50 years, make necessary the re-examination of early assemblages.

The present paper will discuss the objectives and the preliminary results of the Neolithic and Chalcolithic Cyprus Project (NCCP), an ongoing project hosted by the National and Kapodistrian University of Athens. The NCCP focuses on a number of Ceramic Neolithic (ca. 5000-4000/3900 B.C.) and Early/Middle Chalcolithic (ca. 3900-3000/2800 B.C.) sites of the Limassol district (Kouris region). It aims at providing fresh insights into the socio-economic realities and the lifeways of the communities under study. A further objective is to explore the existing socio-economic trends and the habitual activities of the prehistoric Cypriot groups under the perspective of social theory. The reconsideration of domestic architecture and the use of space using a Geographic Information System are supplemented by the application of analytical techniques (e.g. stable isotope analysis on human/animal bones and chemical analysis on pottery) on older and more recently excavated material. Preliminary results already provide valuable new data enabling to proceed to a more holistic view of the regional socio-economic structures during the 5th and 4th millennium B.C.

7 **ENCLOSING THE WILDS: THE EARLY COPPER AGE SITE OF STAMBOLIYISKI IN BULGARIAN THRACE**

**Abstract author(s):** Bacvarov, Krum (National Institute of Archaeology & Museum, Bulgarian Academy of Sciences) - Katsarov, Georgi (Freelance archaeologist) - Nikolova, Nikolina - Tsurev, Atanas (National Institute of Archaeology & Museum, Bulgarian Academy of Sciences)

**Abstract format:** Oral

The last two decades have witnessed a dramatic increase in the number of rescue excavations in Bulgaria that involve the uncovering of large areas of the sites including their peripheries, which would usually have been left unexcavated at regular digs. It is these parts of the sites that reveal previously unnoticed episodes of human activities as ditch digging, re-filling and re-cutting, ritual deposition in pits, etc.

In advance of a gas pipeline construction in 2019, large-scale rescue excavations were carried out at an Early Copper Age site in Bulgarian Thrace. The cultural layer had almost completely been washed away as early as in prehistory; what was left was almost exclusively cut features as enclosure ditches, palisade trenches and/or postholes, and pits. Before the beginning of the Chalcolithic, the immediate area seems to have been uninhabited, and the Stamboliyski community enclosed the ‘empty’ space with successive ditches and walls. Plant (einkorn, emmer, free-threshing wheats, naked barley, lentils, etc.) and faunal (domestic as well as wild animals) remains deposited in the cuts suggest a subsistence economy focused on farming and animal husbandry, but also on hunting, and the available radiocarbon dates show a rather short period of occupation: ca. 4800-4700 calBC. It is the aim of this presentation to reconstruct the sequence of events that turned an ‘empty’ place into a fortified site and to consider alternative occupation scenarios based on the meagre evidence of the site.

8 **OVERVIEW OF THE CHALCOLITHIC IN NORTH MACEDONIA - NEW INTERPRETATIONS IN LIGHT OF THE NEW DATA**

**Abstract author(s):** Spirova, Marina (Archaeological Museum of Republic of North Macedonia)

**Abstract format:** Oral

The past two decades have seen a lot of changes in the research of the Chalcolithic on the territory of North Macedonia. During this period numerous excavations have been undertaken that have yielded new information, which in turn has impacted the study of the Chalcolithic period. Until recent years, the Chalcolithic cultures in North Macedonia were considered as part of the Krivodol-Sălkuta-Bubanj Hum, with elements characteristic for the late stages of the complex. Recent excavations have shown the issue to be more complex than that.

Excavations on sites in the Skopje region have demonstrated the transfer from the Late Neolithic to Early Chalcolithic, exhibiting elements closely related to the Late Neolithic culture. On the other side, new excavations on sites along the Bregalnica River, as well as the systematic excavations at the Tzar’s Towers in Strumica have provided material that bears similarities to the Gradeshnica-Slatino-Dikili Tash complex of the Early Chalcolithic. This data has altered the interpretation of the chronology of Chalcolithic in the eastern region, making it possible to distinguish two phases of its development. New research has been made on sites in the Pelagonia and Mariovo region too, the territory of the regional Shuplevec-Bakarno Gumno group, as part of the Krivodol-Sălkuta-Bubanj Hum complex. Some of the newly excavated sites contain elements from northern groups that have been documented in the late stage of the Shuplevec-Bakarno Gumno and correspond to the Kostolac-Koţofeni horizon in the Morava valley. As such, they provide an insight in the late stages of the Chalcolithic in the region.

The aim of this paper is to show the impact of the results from the recent excavations of Chalcolithic sites and how they have changed the interpretations of the Chalcolithic period and given new directions for the researchers whose topic is the study of the period.

9 **STORAGE AND CULINARY PRACTICES IN THE LAKESIDE NEOLITHIC SETTLEMENT OF DISPILIO, MACEDONIA, GREECE**

**Abstract author(s):** Voulgari, Evangelia (School of History and Archaeology, Aristotle University of Thessaloniki) - Sofronidou, Marina (Ephorate of Antiquities of Kastoria) - Kotsakis, Kostas (Prehistoric Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki)

**Abstract format:** Oral

During the past century, pottery attracted the interest of prehistoric researchers in Balkans far more than other archaeological finds. Its attributes were used mainly as indicators providing evidence on a wide range of issues such as stratigraphic sequences, dating, contacts, and exchange relationships. It was only in the last few years that a renewed interest emerged in approaching the role of pottery in social practices such as food preparation and consumption.

Stemming from our study of the neolithic pottery from Dispilio, this paper examines storage and culinary practices in specific contexts which have been identified by the ongoing analysis of architecture. We will analyze the morphological and technological characteristics of an unusual number of storage and cooking vessels, alongside with their spatial distribution and their associations with other vessels types. We will try to approach the complexity of these food management practices as documented in these architectural contexts.

We will further discuss the variability, development and transformation of the repertoire of vessels. The quantity, the symbolic elab-

oration, and the presence or absence of decorative elements provides considerations for the social meaning and role of these vessels, while, at the same time, puts these practices in the distinct environmental setting of the lake settlement.

10

WHERE TEXTS AND TEXTILES ARE MISSING: AN INTERDISCIPLINARY RESEARCH FOR THE BEGINNINGS OF EARLY WOOL ECONOMY IN PREHISTORIC GREECE

**Abstract author(s):** Papayianni, Katerina - Vakirtzi, Sophia - Mantzourani, Eleni (Department of History and Archaeology, National and Kapodistrian University of Athens)

**Abstract format:** Oral

The exploitation of wool fibres as textile raw materials is considered a milestone in textile history but the beginning of wool economy is a debated issue. Although textiles are extremely rare archaeological finds, it is well established, thanks to the Bronze Age archives written in Linear B script, that during the 2nd millennium BC wool was systematically and intensively produced in the Aegean and that woollen textiles were a cornerstone of Mycenaean economy. As regards earlier periods, a complete lack of written testimonies and of preserved woollen textiles from the Aegean world poses a serious challenge for the reconstruction of wool (pre)history in the region.

Zooarchaeological approaches in combination with textile tool analysis can fill in this knowledge gap, where texts and textiles are missing. Building on previous faunal research trying to infer primary versus secondary husbandry targets, an interdisciplinary project investigating early wool economy in Greece from the beginning of the Neolithic through the Early Bronze Age (7th - 3rd millennia BC) is in progress. Conventional analysis, such as reconstruction of sheep mortality profiles and skeletal biometry is combined with a novel analysis of sheep bones via geometric morphometrics, to trace evolutionary patterns of sheep breeding indicative of wool production linked with high wool yields. Points of reference will be sought after native Greek sheep breeds. Patterns deriving from the zooarchaeological data will be cross-examined with patterns of a dataset deriving from the functional analysis of spindle whorls, the tools used for making thread out of fibres.

In this paper we intend to present the framework of our project, the research methodology, the sites that comprise our datasets and preliminary results of our research.

11

RECONSIDERING THE IMPORTANCE OF DEBITAGE WASTE IN THE STUDY OF THE PREHISTORIC OSSEOUS INDUSTRIES: THE CHALCOLITHIC SETTLEMENT FROM DRĂGUȘENI (ROMANIA)

**Abstract author(s):** Margarit, Monica (Valahia University of Targoviste; “Vasile Parvan” Institute of Archaeology, Romanian Academy) - Boroneant, Adina - Balasescu, Adrian (“Vasile Parvan” Institute of Archaeology, Romanian Academy)

**Abstract format:** Oral

Classical studies of prehistoric osseous industries have paid attention to the finished pieces especially which usually preserve only marks resulted from the final stages of the shaping operation. In most cases,debitage methods were assumed based on the type of blanks used only. Debitage waste is rarely mentioned such these studies, and sometimes not even collected during the archaeological excavations. Our study aims to draw attention precisely on these types of archaeological remains, which often become much more important than the finished pieces when it comes to the reconstruction of the technological schemes of the raw material processing. As a case study, we have chosen the Cucuteni settlement from Drăgușeni (Romania). The excavations yielded an important osseous archaeological assemblage, including debris resulted mainly from the processing of Bos taurus bones and Cervus elaphus antlers. In the case of bone, a method ofdebitage through bi-partition or quadri-partition was applied, mainly by double grooving. This method is extremely efficient, with up to four regularly shaped blanks obtained from one bone, later to be transformed into finished pieces. Pointed tools, chisels and spoons were also manufactured. In the case of antler, the bipartition method by double grooving has been used most often, resulting bevelled tools mainly. In the case of archaeological assemblages composed only of finished pieces made on flat blanks, we can usually clearly identify only the longitudinaldebitage method used, but given the presence of the above mentioned wastedebitage we could also infer the combination of procedures involved in thedebitage operation.

Acknowledgements

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12

BONE TECHNOLOGY IN THE LATE NEOLITHIC IN THE CENTRAL BALKANS

**Abstract author(s):** Vitezovic, Selena (Institute of Archaeology, Belgrade)

**Abstract format:** Oral

Studies of technology in general, and in particular bone technology were for a long time a neglected topic in the south-eastern European prehistoric archaeology. This began to change in past two decades, when several studies focused on lithic and bone technology in the Neolithic appeared, that included not only typological analyses, but also paid attention to the raw material selection, manufacturing procedures and use wear traces.

In this paper will be provided an overview of the current results regarding the bone industries in the Late Neolithic, with focus on two large Vinča culture sites, Vinča-Belo Brdo in the vicinity of Belgrade, and Pločnik near Prokuplje. Industries at both sites show careful

selection of raw material, with important ratio of antlers, which were systematically collected and used. Manufacturing techniques revealed high standardization and even suggest the possibility of early stages of specialization. Typological repertoire also revealed some of the culture-specific techno-types, but also some differences that could be regional and/or linked with economy – such as presence of hooks and harpoons at Vinča-Belo Brdo. Pločnik is also the site with early evidence of copper metallurgy, and the large amount of carefully made bone objects show that this was still an important raw material, despite the emergence of new technologies. Overall, bone technology also shows high level of standardisation and the presence of skilful craftspersons. Unfortunately, it was not possible to locate possible working / activity areas where bone and antler objects were produced, although the presence of manufacture debris shows this production was local.

13

OSSEOUS INDUSTRIES FROM THE NEOLITHIC LAKESIDE SETTLEMENTS OF MACEDONIA, GREECE. THE CASE OF SETTLEMENT ANARGHIRI IXB

**Abstract author(s):** Arampatzis, Christoforos (Aristotle University of Thessaloniki)

**Abstract format:** Oral

In the last twenty years the Archaeological Service of Florina has investigated a lot of prehistoric settlements that were established between the four lakes of the area (Chimaditis, Zazari, Vegoritida and Lake Petron) and date back from the Greek Early Neolithic (6700/6500-5800/5600 BC) to the Greek Late Bronze Age (1700/1500-1100 BC).

One of the biggest settlements of the area is the lakeside settlement Anarghiri IXb that was situated in the northeastern shore of lake Chimaditis. The four rescue excavation campaigns (2013-2016) unearthed a settlement that was inhabited almost uninterruptedly from the middle of the 6th millennium BC to the end of the 5th millennium BC (Greek Late Neolithic and part of the Greek Final Neolithic) while there is scant evidence that it was also inhabited during the Greek Early Bronze Age (3300-2000 BC). The investigation yielded thousands of wooden piles, thermal structures and thousands of figurines, chipped stone tools and osseous artifacts.

The osseous artifacts from the Neolithic layers of the settlement form one of the biggest assemblages in Balkans. Their preliminary study shows that they played a great role in the everyday activities inside and outside of the settlement as pointed tools, bevel ended tools, scrapers, sleeves, hunting and fishing equipment, projectile points and needles have been found there. In this short presentation, an attempt will be made to present the preliminary results of the ongoing study of these artifacts, which is related to the raw material preferences, typology, manufacture and use.

Acknowledgements

This research is co-financed by Greece and the European Union (European Social Fund- ESF) through the Operational Programme «Human Resources Development, Education and Lifelong Learning» in the context of the project “Reinforcement of Postdoctoral Researchers - 2nd Cycle” (MIS-5033021), implemented by the State Scholarships Foundation (IKY).

14

THE CHARACTERISTICS OF POLISHED STONE IMPLEMENTS ON THE TERRITORY OF THE SOPOT CULTURE IN THE EASTERN PART OF CROATIA

**Abstract author(s):** Rajkovic, Dragana (Archaeological museum Osijek) - Antolin, Suzana - Balen, Dražen - Tibljaš, Darko (University of Zagreb, Faculty of Science)

**Abstract format:** Oral

This paper will focus on the rescue excavations carried out in past decades in the eastern parts of Croatia, especially on the territory of the Sopot culture of the Late Neolithic and the Early Eneolithic. Here will be presented an overview of the current results regarding the stone industries in the Late Neolithic, with the focus on localities in the Đakovo region, in the eastern part of the Slavonian mountains and their chronological position. On the analyzed sites, but also in the wider area of distribution, it is evident that with the Sopot culture, the total number of stone finds and types of polished stone tools is increasing and that the polished stone tools were an important factor in the material culture of the Neolithic communities. However, these studies still have a large number of unresolved questions. There is much more information about the manufacturing process, typology, and raw material selections, but the locations where the raw material was explored are still unknown. In order to better characterize mineralogical and chemical characteristics of some of the findings, that are necessary in provenance studies, a series of investigations has been initiated using optical, XRDICP –AES and ICP-MS methods of analysis.

15

SOURCING OF OBSIDIAN ARTIFACTS FROM PREHISTORIC SITES IN CROATIA BY PXRF

**Abstract author(s):** Tykot, Robert (University of South Florida)

**Abstract format:** Oral

The use of obsidian in central and southeast Europe during prehistoric times has been recognized by the discovery of obsidian artifacts at many sites, especially during the Neolithic. The volcanic sources, in Hungary, Slovakia, and the Ukraine, have also been identified, and since the 1970s shown to have chemical fingerprints distinguishing them into four or more groups. Prior to this millennium, however, the analytical methods available were destructive and costly, while in some countries political situations also limited artifact studies. In Croatia, few obsidian artifacts had even been found at archaeological sites, and not a single obsidian artifact had been chemically sourced prior to 1998. Over the past two decades, extensive archaeological work on prehistoric sites



in Croatia have identified obsidian artifacts at many sites along the Adriatic coast and several of the islands, as well as inland in the Slavonia area of northeastern Croatia.

The use of a portable X-ray fluorescence (pXRF) spectrometer has enabled the author to conduct analyses non-destructively in several museums and other facilities in Croatia. This has been accomplished on more than 300 obsidian artifacts from 15 archaeological sites, with the elemental data compared directly with analyses done with the same instrument on a large number of geological samples from the central European and Mediterranean sources. Assignment to the Central Europe sources was expected for the sites in northern Croatia, with the artifacts coming mostly from Vinički. But for sites in southern Croatia it was surprisingly found that Lipari obsidian comprises >90%, while small numbers from Palmarola and Melos (<1%). These results strongly suggest that maritime travels, both from the original acquisition of the obsidian from these two islands, and likely along or over the Adriatic Sea, were easier and more frequent than travel southward over the mountainous Dinaric Alps.

a. **THE BEGINNING OF THE EARLY COPPER AGE IN THE MIDDLE STRUMA VALLEY: TWO SITES IN SOUTHWEST BULGARIA**

**Abstract author(s):** Katsarov, Georgi (Freelance archaeologist)

**Abstract format:** Poster

This poster presents main field results from the excavations of two archaeological sites from the beginning of the fifth millennium BC in Southwest Bulgaria – Moshtanets-Chukata and Strumsko – Kaymenska Chuka.

Both sites are located at the uplands’ highest points opposite to one another, on the left and right bank of Struma River, in the southern part of the Blagoevgrad hollow. These are small fortified settlements situated at important and strategic places that are difficult to approach. This position controls the access to and from the narrowing of the river in the Kresna Gorge and the Aegean coast in southern direction, the Upper Struma valley to the north and the Vardar River valley to the west.

The beginning of the fifth millennium BC in the region is relatively poorly investigated phase but it is a key period for the formation of the society during the times of the emerging copper metallurgy. The Moshtanets and Strumsko proximity to the well-established are deposits nearby gives further indication about the significance of the Blagoevgrad’s hollow geographical location.

The presence of two small fortified sites located in close proximity to each other speaks for a well-organized settlement system in the northern part of the Middle Struma valley. The analogues stratigraphy, topography and plan characteristics of the sites as well as their similar ceramic repertoire suggest their simultaneous functioning.

b. **FADING LIKE A FLOWER: DEPOPULATION IN THE GREAT HUNGARIAN PLAIN DURING THE COPPER AGE**

**Abstract author(s):** Ridge, William (University of Illinois at Chicago)

**Abstract format:** Poster

The Bodrogkeresztúr culture of the Middle Copper Age has long been distinguished for its numerous large cemeteries and compelling metal goods, particularly heavy copper axes and gold ring-pendants. These features are accompanied by a lesser examined decrease in the total number of sites throughout the Great Hungarian Plain. The pattern of decline continues through the end of the Middle Copper Age (Hunyadihalom culture) and appears to be related to a process of regional depopulation. By the Late Copper Age, there seems to be a population rebound, with the influx of the Boleráz/Baden and Steppean groups from outside the Carpathian Basin.

Here, I examine the cause(s) behind the decline in the number of sites by addressing two primary research questions: 1. How did the settlement patterns of the central Plain change from the Late Neolithic through the Copper Age? And, 2. How do the different cultures of the Early and Middle Copper Ages (i.e. Tiszapolgár, Bodrogkeresztúr, and Hunyadihalom) relate to each other chronologically and culturally. I draw from the robust datasets provided in the Magyarország Régészeti Topográfiaja (Archaeological Topography of Hungary) volumes and my own field research in Eastern Hungary, as well as synthesizing available data from around the region. Particularly crucial has been the recent focus on radiocarbon dating (e.g. Raczky & Siklósi 2013) that has demonstrated temporal overlap of traditionally-viewed sequential Copper Age culture groups. Nonetheless, my research indicates that there was a marked depopulation in the central Plain that is likely related to other demographic shifts experienced throughout Southeastern Europe during the late-5th and 4th millennia BCE.

c. **SMALL SHEEP OF THE MARSHES: REDUCED LIVESTOCK BODY SIZE IN THE SOUTHERN CARPATHIAN BASIN COPPER AGE**

**Abstract author(s):** Tomazic, Iride (University of Michigan) - Nicodemus, Amy (University of Wisconsin La Crosse)

**Abstract format:** Poster

Marshy environments are one of the most diverse and important ecosystems on the planet. While wetlands offer refuge to numerous wild plants, animals, and insects, they can represent a challenging living environment for humans and their livestock. However, despite the difficulties, anthropological evidence of marshland exploitation has been seen in the past. This research examines livestock from the Copper Age when large areas of the Southern Carpathian Basin were marshes. At our central case study, the cemetery of Podlokanj, Northern Serbia, 38% of individuals were buried with animal bones, primarily sheep (*Ovis aries*). Domestic animals from this assemblage were particularly small, even considering the general trend for smaller livestock in the Copper Age

compared to those of the Neolithic. By contrasting the Copper Age zooarchaeological data from a wider region, with both geographic and ecological diversity, this research assesses the potential effects of the local environment on livestock management systems, including body size reduction as an adaptation to adverse conditions.

d. **FARMING BEGINNING IN SOUTHWESTERN TRANSYLVANIA (ROMANIA): ANIMALS REMAINS AND PHYTOLITHS FROM THE EARLY NEOLITHIC SITE OF ȘOIMUȘ – TELEGHI**

**Abstract author(s):** Malaxa, Daniel (Faculty of Biology, Alexandru Ioan Cuza University of Iași) - Danu, Mihaela (Faculty of Biology, Research Department, Alexandru Ioan Cuza University of Iași) - Cabat, Alexandra (Faculty of Biology, Alexandru Ioan Cuza University of Iași) - Bărbat, Alexandru (Museum of Dacian and Roman Civilisation, Deva) - Stanc, Simina (Faculty of Biology, Alexandru Ioan Cuza University of Iași) - Bejenaru, Luminița (Faculty of Biology, Alexandru Ioan Cuza University of Iași; Romanian Academy – Iași Branch, “Olga Necrasov” Center of Anthropological Research)

**Abstract format:** Poster

The penetration of the early Neolithic communities in southwestern Transylvania and their establishment in the Mureș Valley were motivated by finding good areas for animal husbandry / grazing and possibly plant cultivation. The present study tries to answer questions related to the beginnings of the neolithization in the southwest of Transylvania, from interdisciplinary perspective, valuing archeozoologically and archeobotanically the Starčevo-Criș site of Soimuș-Teleghi (Hunedoara County, Romania), dated to 7th – 6th milenium BC.

Animal remains and phytoliths offers information on the settlement palaeoeconomy and paleoenvironment. The most animal remains come from domestic mammals (about 92%), especially cattle (*Bos taurus*) and sheep / goat (*Ovis aries* / *Capra hircus*), and very few remains of pig (*Sus domesticus*) and dog (*Canis familiaris*). The wild mammals are less represented (about 7%): red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), aurochs (*Bos primigenius*), roe deer (*Capreolus capreolus*) and polecat (*Mustela putorius*). The very low frequency of pig (0.76%) suggests that this Starčevo-Cris community had a high mobility, specific to shepherds. The phytoliths assemblages show the net dominance of grasses, several subfamilies of Poaceae family being attested. ELONGATE DENDRITIC forms, deriving from the inflorescence or the husk of grasses, are quite well represented (over 15%). These phytoliths are most likely indicative of cultivated crop plants which may include *Triticum* sp. (wheat), *Hordeum vulgare* (barley), *Secale cereale* (rye), etc. Bioarchaeological data indicate an open environment around the settlement, where people bred especially cattle and sheep/goat flocks. Occasionally, the inhabitants practiced hunting and gathering molluscs, as indicated by archaeozoological data.

e. **BOUNDED BY SEA: A REVIEW OF NEOLITHIC WORKED ANIMAL BONE IN THE NORTH AEGEAN**

**Abstract author(s):** Paul, Jarrad (Trinity College, the University of Melbourne)

**Abstract format:** Poster

The Neolithic (7000-5500 BCE) emerged in the North Aegean (western Turkey, northern and central Greece, and the Aegean islands) bringing with it an influx of new material and subsistence strategies into an already established region. Worked animal bone, including tools and objects, were consistently created, used, and discarded by these Neolithic societies to support their new agricultural way of life. The role of worked animal bone within these groups was to support everyday activities such as pottery moulding, textile manufacture, and hide preparation while also performing an important symbolic role during special events. In this poster, a brief comparative analysis of research, taken from publications, conducted at almost 100 sites in the region is presented. Tool types, manufacturing techniques, and use-wear analysis are analysed to present a glimpse of worked animal bone collections at this geographic and cultural cross-road. This review is timely considering current genetic evidence that supports a complex model of Neolithic influence in the North Aegean. Further discussions also highlight the rich material record spread across this complex landscape.

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**PREHISTORY, ARCHAEOLOGY AND ARCHAEOLOGISTS AS REFLECTED IN SCHOOL BOOKS AND CURRICULA**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Bozoki-Ernyey, Katalin (Government Office of the Capital City Budapest, Heritage Department) - Demoule, Jean-Paul (Institut Universitaire de France & Université de Paris I) - Pawleta, Michał (Faculty of Archaeology Adam Mickiewicz University)

**Format:** Regular session

The presence and dominant images of prehistory, archaeology and archaeologists in school books (written for children between the ages of 5 to 18) is a topic rarely explored, but it seems to be of crucial importance for the discipline. It relates not only to the very ways the knowledge of prehistory is conveyed to the young generations but also how present-day archaeology’s results, roles and responsibilities are understood and wants to be understood. The abundance of stereotypical, mythical or incorrect images of the past and improper image of the present day archaeology reduces the impact that archaeologists might have on construction of proper up-to-date narratives about the past as well as the real face and a role of a discipline in case of today young generations.

We are not going to discuss archaeological education in general and in museum pedagogy. Proposals should focusing on:

- the indication of general attitudes towards presenting prehistory and archaeology in school textbooks;
- how teaching prehistory is incorporated into the education of children between the ages of 5 to 18 and curricula;
- the indication of mythical and distorted perceptions of various aspects of the distant past – e.g. national myths, gen-



- der stereotypes, ethnic biases;
- the examination of the influence of political and/or economic systems and dominant historical politics on the images of prehistory and archaeology;
- the role of images of prehistory in the processes of creation of local, national and supranational identities connected to school books;
- the whether and how informal archaeological education can influence school curricula;
- what measures should be undertaken by archaeologists to change the present situation, engage with teachers and to contribute to better understanding of images of the past and archaeology conveyed through school books;
- case studies, good and bad practices.

## ABSTRACTS

### 1 ARCHAEOLOGY, PREHISTORY AND OTHER DIRTY THINGS: REFLECTIONS ON GREEK HISTORY CURRICULA AND PRIMARY TEXTBOOKS OF THE LAST 40 YEARS

**Abstract author(s):** Kasvikis, Konstantinos (-)

**Abstract format:** Oral

Ancient history, archaeology and classical antiquity have always been significant for modern Greek society and have contributed greatly to its national imagination. As a result, knowledge of the past permeates many aspects of social life, including education. The aim of this paper is to provide an overview concerning the image of archaeology as a discipline and as content knowledge in Greek Primary and early Secondary education (6-12 and 12-15 years old, respectively).

For this purpose, firstly, the current research data on primary education textbooks of various teaching subjects (History, Language, Environmental studies, Geography, Religion etc.) are discussed, focusing on those of two periods: the early 80s to 2006 and 2006 to the present. The research indicates that a plethora of archaeological information is included in the textbooks of both research periods, in which the perception of material culture as history of art, the adoption of a culture-historical approach in the interpretation of the past and the ideological use of archaeology is dominant. Nevertheless, despite this abundance of archaeological content knowledge in various textbooks, archaeology is not officially introduced in the history curricula and no substantial interrelation of archaeology with historical understanding was ever acknowledged.

The second part of the paper focuses on the new history curriculum (2018-2019) for compulsory education (6-15 years old) which, for the very first time, not only introduced archaeological knowledge but also archaeological skills as a structural tool for history learning and reconsidered themes and approaches concerning prehistory. However, this new history curriculum as yet remains inactive due to political reasons.

### 2 HOW DID ARCHAEOLOGY LOOK LIKE FOR A SCHOOL KID IN SOVIET OCCUPIED LATVIA (1940-1941; 1944-1991)?

**Abstract author(s):** Broka-Lace, Zenta (Institute of Latvian History, University of Latvia)

**Abstract format:** Oral

In this historiographically oriented paper I analyze school books that were in use in Latvian schools during the Soviet occupation. The aim is to explore those aspects of archaeology and prehistory considered important for young generation to learn and what seems to be left out or purposely neglected. This topic inevitably deals with political ideology of Soviet Communism and Marxist views on history. I try to show how the Soviet story of prehistory differs from the one relevant in current agenda, and what today could be considered false and distorted. The paper also discusses how up to date, scientifically accurate and complete the material provided for school kids was according to the ruling historiographic school of archaeology. The paper offers a look into the peculiar history writing tradition of Soviet Union working under a different image of prehistory of which it was a necessity to have a good expertise in for children as well as for every loyal Soviet citizen. The paper proposes a case study which provides a deeper understanding of a pattern how totalitarian country generates archaeological thought through different media.

### 3 PREHISTORY, ARCHAEOLOGY IN SCHOOL HISTORY BOOKS TODAY IN HUNGARY AND THE LEVEL ASSESSMENT OF FIRST YEAR BA HISTORY STUDENTS

**Abstract author(s):** Bozoki-Ernyey, Katalin (Government Office of the Capital City Budapest, Heritage Department) - F. Romhányi, Beatrix (Károli Gáspár University of the Reformed Church in Hungary)

**Abstract format:** Oral

The subject of this session turned out to be very actual in Hungary as the National Core Curriculum (NCC), compulsory for all educational institutions and stakeholders, issued by the Government in 1995, was just in January 2020 amended and will be introduced from September.

In the first part of this paper K. Bozóki-Ernyey will focus on the prehistory chapter of elementary and secondary school history school books used today. Texts and pictures are analysed from different point of views: how the data is correct, how it is up to date, what is the ratio between the knowledge on Hungarian, European and world prehistory. How much archaeology, archaeologists are men-

tioned and in what contexts. The conclusions will be presented in the light of older school books. If possible, also practical results will be shown.

In the second part of this paper B. F. Romhányi will give an overview of finishing secondary school what knowledge in history is acquired, presenting the results of a very recent survey. A level assessment of first year BA students studying history (representing about 80 per cent of all the enrolled) was made in 2019 on the initiative of some Hungarian universities offering BA and teachers' training programs in history. The results were shocking in many respects. From the point of view of archaeology, the results of the pre-modern period may be of interest. The paper will present the main questions and the decisions made when compiling the test, as well as the evaluation of the results. It is also the aim of the presentation to identify some key problems, especially with regard to the learning methods of the young generations and to the training of future teachers.

## 4

### ARCHAEOLOGY AND HISTORY IN SPANISH SCHOOL CURRICULA

**Abstract author(s):** Ruiz del Arbol Moro, Maria (Institute of History, CSIC, Madrid)

**Abstract format:** Oral

The presentation will analyse the contents related to history (focussing in prehistory and ancient history) and archaeology in school curricula of Primary School (6-12 years old) in Spain. Spanish school curricula varies depending the regions, so I will focus on two case studies: Madrid and Navarra regions, to present narratives about the past and its regional variations. I will discuss several issues stressed by the organizers of the session, mainly:

- general attitudes towards presenting prehistory and archaeology in school curricula and how this is reflected in text-books;
- how teaching prehistory and ancient history is incorporated into the education of children and curricula;
- the examination of the influence of political systems and dominant historical politics
- the role of images of prehistory in the processes of creation of local, national and supranational identities connected to school books and school activities;
- measures undertaken by our research team to contribute to change the present situation (work with teachers).

## 5

### SONGS OF THE LAND: STORYTELLING, PREHISTORY AND IDENTITY IN WELSH EDUCATION

**Abstract author(s):** Foreman, Penelope (Clwyd-Powys Archaeological Trust)

**Abstract format:** Oral

In 2020 a new curriculum was launched for education of 3-18 year olds in state education across Wales. At its core, it seeks to ground young people in “four purposes”: to be ambitious, enterprising, ethical, and healthy. Humanities, where archaeology and heritage sit, is a core strand of this new curriculum. It is explicitly designed to blend an understanding of diverse cultural experience whilst at the same time developing a sense of cynefin - by their definition;

“The place where we belong, where the people and landscape around us are familiar, and the sights and sounds are reassuringly recognisable. Though often translated as “habitat”, cynefin is not just a place in a physical or geographical sense: it is the historic, cultural and social place which has shaped and continues to shape the community which inhabits it.”

This new curriculum calls for experiential learning, for expert outsiders to share their knowledge inside schools, for learning to take place beyond the classroom walls. Stories ancient and modern are interwoven in Welsh culture - from the Mabinogion to Tryweryn - and telling the stories is never a neutral act. How can archaeology mediate between the struggle to construct an identity in modern Wales with the need to preserve the complex and intricate histories that have woven the fabric of Welsh contemporary culture? How is the right to cultural experience established in the curriculum, and does it instil a ethical, ambitious, and enterprising attitude in Welsh young people?

This paper will explore the ways the new curriculum has been reflected in children’s literature, school resources, and heritage site interpretation.

## 6

### THE PREHERSTORY, AN ANALYSIS OF SPANISH CURRICULA FROM A GENDER PERSPECTIVE

**Abstract author(s):** Schick, Andrea (University of Vigo, GEAAT)

**Abstract format:** Oral

Within the framework of Public Archeology and gender studies from a critical perspective, we present a case study on the discourses built around Prehistory, analyzing for these textbooks of Primary and Secondary Education from 1980 to 2016. The aim is to calibrate the guidelines and transformations of the discourse, both in its textual and visual aspects, from a gender perspective, as well as assess the continuities and divergences between the different educational laws and advances in archaeological research. To this end, a systematic methodology created ex-process is implemented in order to identify the prevailing informative patterns and define the historical situations and objects that shape the discourse as a diagnosis. This methodology is based on the strategies and tools of analysis of the Discourse Theory, specifically the current of the Critical Discourse Analysis, and Semiotics.

The progress of the results shows the need to reflect on the process of transmission of generating knowledge about Prehistory in relation to gender in the educational field since there is a discourse of destruction, violence, and power against care, socialization and group maintenance. In short, a discriminatory and simplistic discourse that is based on a fictitious cultural heritage marked by

	great subjectivity and false accumulated objectivity.
7	<p><b>THE MALE PAST: PREHISTORY IN FINNISH PRIMARY SCHOOL TEXTBOOKS</b></p> <p><b>Abstract author(s):</b> Aalto, Ilari - Kemppinen, Lauri (University of Turku)</p> <p><b>Abstract format:</b> Oral</p> <p>In the Finnish school system, prehistory is taught only in the fifth and sixth grades (11 to 13 years old). The prehistory of Nordic countries is not covered even in the upper high school. Finnish National Agency for Education gives only loose guidelines concerning the content of textbooks, and publishers are rather free to include or exclude the information as they see fit. However, there has been a drastic change of paradigm in representing the prehistory in the 2010s: new history textbooks have diminished the role of historical information in favour of historical skills. Archaeological cultures or prehistoric periodization are mostly left untouched. Instead of material culture, the textbooks focus in ancient mythology and religion which relate more to the folklore documented in the 19th century than actual prehistoric practices. Still the interpretations presented in the books tend to be rather conservative. It is especially noteworthy that prehistory is mostly presented from the male point of view: males dominate the fictitious text chapters and when presented at all, women are mostly described in connection to domestic work and as non-active agents. The same is true in textbook illustrations, where women are often presented in very conventional settings. Women represent only a quarter of the cases where the sex of a person is defined in the books. This is curious, as there is not any more archaeological evidence of males than there is of females in prehistoric times.</p>
8	<p><b>THE PERCEPTION OF ARCHAEOLOGY AND ARCHAEOLOGISTS AMONG PRE-SCHOOL AND SCHOOL CHILDREN IN A SMALL AGRICULTURAL COMMUNE OF GRANOWO, POLAND</b></p> <p><b>Abstract author(s):</b> Pawleta, Michal - Rybarczyk, Anna (Adam Mickiewicz University)</p> <p><b>Abstract format:</b> Oral</p> <p>The aim of this presentation is to present results of surveys conducted among pre-school and school children (aged 3-14) in Granowo commune in Greater Poland Voivodeship. It is one of the smallest commune in the region with strong agricultural traditions, where there are no archaeological sites with visible features in the landscape and no extensive excavations had taken place in the past.</p> <p>The undertaken research was conducted in two school and pre-school units in Granowo and Bielawy in a period between 2018 and 2019. It had a form of questionnaires given to the kids. In sum, 58 respondents answered to several questions. The questionnaire was adapted according to particular age groups. It was structured around some thematic blocks, namely: general attitude to archaeology, the ways of getting to know about archaeology and archaeologists, archaeology and the popular culture, curiosity of archaeology and a portrayal of archaeologists – his/her professional tasks, clothing styles the and the place where they work.</p> <p>Results of undertaken research have proven that among children an image of archaeologists and the discipline itself is positive and accurate but partially it is still influenced by stereotypes and popular culture clichés. Further they have indicated children’s interest in archaeology and their expectations for educational and outreach informational actions undertaken by archaeologists to raise their awareness about archaeology.</p>
9	<p><b>SUPPORTING TEACHING INCORPORATES ARCHAEOLOGY INTO SCHOOL CURRICULUM</b></p> <p><b>Abstract author(s):</b> Paulsen, Charlotte (Museum Skanderborg)</p> <p><b>Abstract format:</b> Oral</p> <p>During the last ten years, Museum Skanderborg has offered a variety of learning session to the local primary and secondary schools. Six out of 10 learning sessions are based on archaeological excavation and research and archaeological methods are explained as part of the sessions. The sessions are developed to support curricula in the schools and to complement and underpin the scholarly teaching in subjects. The aim is to use history and archaeological artefacts to support and develop shared identity of the children and make them feel part of history.</p> <p>Another offer for the school are the possibility of having the museum curator and archaeologist visiting the school giving a lecture of nearly any given subject of local historical or archaeological origin they wish for. Five years ago, the Danish government rolled out a school reform where they introduced the term “Supporting Teaching”. Others than schoolteachers can teach these lessons and that is what the museum does by offering these lectures. Especially the story of the grave of a Viking chieftain and rider from the local area is very popular.</p> <p>When the museum has a high profile excavation, we offer special learning sessions at the excavation site. These sessions are of limited number as the work at the excavation is not to be disturbed too much by the teaching. The excavation sessions always get booked out and sometimes have a waiting list. Archaeology is quite popular.</p> <p>The paper will present the connection to school curricula of the museum’s variety of learning offers. With examples from real life with the school classes engaging with archaeological knowledge, we share our concepts of an educational role-play, supporting teaching lectures, field archaeology visits and more.</p>

10	<p><b>MINED PERIOD, PREHISTORY REVEALS THE HISTORY TEACHING DIFFICULTIES AT SCHOOL</b></p> <p><b>Abstract author(s):</b> Gransard-Desmond, Jean-Olivier (ArkéoTopia, une autre voie pour l’archéologie)</p> <p><b>Abstract format:</b> Oral</p> <p>Confusion between paleontology and archaeology is a common error in primary and high school teaching in France, but it is not the only difficulty to overcome at school and in school books. Wrong logical chronology, prehistorical cultures technicity considered as undeveloped, archaeology considered only from the excavation point of view, aso., the teaching of prehistoric and historic times in France generates numerous mixes between disciplines and periods as well as false ideas (linear evolution, eurocentric vision, aso.) among children as well as teachers.</p> <p>Using case studies, we will show what are the difficulties to overcome for a respectful prehistoric times teaching dealing with our true current knowledge of periods and disciplines. We will, also, present some experiments done with school student from 7 to 8 years old (CE1-CE2) at primary schools in Saint-Denis. In conclusion, other possibilities will be present to change the prehistory teaching in order to distinguish cultural prehistoric teaching and natural prehistoric teaching, or how archaeology, associated to events or organizations linked to science workshops, would provide a better vision of what prehistory and archaeology are.</p>
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392	<p><b>MULTISCALAR APPROACHES TO INTERACTION THE MEDITERRANEAN: SHEDDING LIGHT ON LOCAL AND REGIONAL MOBILITY</b></p> <p><b>Theme:</b> 1. Networks, networking, communication: archaeology of interactions</p> <p><b>Organisers:</b> Gheorghiadé, Paula (University of Toronto) - Buckingham, Emma (University of Missouri)</p> <p><b>Format:</b> Regular session</p> <p>According to Horden and Purcell, “the paradox of the Mediterranean is that the all-too-apparent fragmentation can potentially unite the sea and its coastlands in a way far exceeding anything predictable of a continent.” In the Late Bronze Age (LBA), the centrality of the sea to communication, trade and mobility connected distant lands and cultures from the Levant to Crete, Egypt, mainland Greece and as far as southern Italy and Sardinia. These LBA trade networks were likely foundational to later maritime expansion exemplified through Phoenician trade networks, and Greek colonization. However, such an emphasis on long distance interaction has disregarded the movement of people and goods at a range of other scales. The connections between local and regional communities likely formed the backbone of larger social and economic networks visible in patterns of the archaeological record.</p> <p>The aim of this session is to consider connectivity at a range of other scales, for example: locally, between people and objects; regionally, between various communities; and trans-regionally, between larger regional centres. Such local and regional interactions were likely fundamental in the spread and incorporation of technology, ceramics and/or cultural traditions that in turn shaped how we study, approach and understand cultural transmission, interaction and connectivity from the surviving archaeological evidence.</p> <p>We welcome papers that deal with interaction in and around the Mediterranean and especially encourage papers that take a multi-scalar and/or diachronic approach from a variety of methodological and theoretical perspectives. Approaches may consider, for example, novel methodological applications to explorations of interaction, connectivity, trade, and exchange; micro and meso interactions in archaeology; collection, integration and analysis of large archaeological datasets; application of network science methods to archaeological questions; interdisciplinary approaches to the question of mobility, trade, and exchange from the prehistoric to historic periods; the application of statistical modelling in culture-contact scenarios and in discourses surrounding the creation and maintenance of identities; diachronic and/or theoretical explorations of urbanization, localization, and globalization(s).</p>
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ABSTRACTS

1	<p><b>SCALES OF MOBILITY IN MINOANISATION</b></p> <p><b>Abstract author(s):</b> Knappett, Carl (University of Toronto)</p> <p><b>Abstract format:</b> Oral</p> <p>Recent studies of ‘Minoanisation’ suggests various kinds of mobility across a wide area of the southern Aegean in the early LBA, with traders and craftspeople in particular seemingly on the move as never before. Such bundled interaction—like other ‘-isations’ that have been identified in the Mediterranean (e.g. Hellenisation and Romanisation)—seems very well suited to various forms of network thinking and analysis. Viewing such phenomena as networks has led to greater scrutiny of the centre-periphery assumptions in the characterisation of such ‘-isation’ processes. However, do regional scale processes of this kind leave the local scale unchanged, as a kind of bedrock from which ever wider interactions spring? Or do local interactions themselves change in such ‘globalising’ scenarios? This paper addresses this overlooked question of the local scale on Crete in the context of Minoanisation. What do we imagine happens to local mobilities? Is the local level of the household or ‘House’ at most Cretan sites affected, or is it really only ‘gateway’ sites that participate in and modulate the new globalised connections of the early LBA period? In a strongly hierarchical society one might imagine that only the elites participate and benefit; and yet, Minoan Crete has been characterised in recent scholarship as having a more egalitarian and heterarchical structure than is typically anticipated for early complex societies. Might this then mean that we should expect considerable local involvement of households or Houses in regional scale mobilities (i.e. more ‘movers’ than ‘stayers’, Woolf 2016)? Although the focus of this talk will be more historical than methodological, I will also raise</p>
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issues concerning the kinds of data required to address such questions in network terms.

Woolf, G. 2016. Movers and Stayers. In L. de Ligt and L. Tacoma (eds.), *Migration and Mobility in the Early Roman Empire*, 438–61. Leiden: Brill.

2 AN INFORMATION THEORETIC APPROACH TO MYCENAEAN POTTERY DATASETS

**Abstract author(s):** Price, Henry (Imperial College London) - Gheorghiad, Paula (University of Toronto) - Vasiliauskaite, Vaiva - Rivers, Ray (Imperial College London)

**Abstract format:** Oral

Archaeological data sets have a tendency to be large and sprawling, with individual artefacts typically belonging to several categories insofar as they permit classification. This makes it very difficult to present the data simply enough to expose its main regional and temporal properties.

In this paper we use ideas from information theory to establish key attributes of a 13,700+ ceramic data set from five Cretan sites spanning the period LM II - LM III B collected by one of us (PG). The key ingredient is entropy, understood as negative information, a measure of disorder. From these origins diversity measures emerge, as the more disordered or simply less structured data are in turn also more diverse.

Entropy is not uniquely defined and different measures of diversity (different Hill numbers) are distinguished by the weights attached to common and rare elements, which reflect issues with sampling. Archaeologists rely heavily on drawing inferences from the change in the types of artifacts found at various sites at different times. In this paper we show that diversity measures on a time sliced dataset of Late Bronze Age ceramics can give us useful information of this at a broader level.

This is insufficient in itself in that diversity alone, while counting key attributes, does not identify which individual attributes are the most important at any time and place. For this we turn to decision trees, which also use entropy as the primary metric to divide datasets into meaningful partitions. We explore what are the “meaningful” partitions that help identify those artifacts which contribute most to the classification of data at these Cretan sites over time. We finally turn to how this can be applied in ensembles, implementing bootstrapping to give a robust measure of the stability of our conclusions at each time slice.

3 “AN ALIEN AMONG US”. ANALYSING CASTING PROCEDURES IN THE LBA SETTLEMENT AT STAVROS, CHALANDRITSA IN WESTERN ACHAEA, GREECE

**Abstract author(s):** Iliopoulos, Ioannis (University of Patras; Universitat de Barcelona) - Soura, Konstantina (Hellenic Ministry of Culture, Ephorate of Antiquities of Achaea)

**Abstract format:** Oral

Excavations at the LBA settlement at Stavros, Chalandritsa in Western Achaea, Greece have provided evidence of in situ metalworking, such as several fragments of refractory ceramics and a clay tuyère. However, the most prominent as well as unexpected for such a peripheral village find was the one half of a double mould used for the casting of whole-cast socket spearheads. Its significance lies not only on its meticulous manufacture but mainly on the scarceness of similar items in the LBA Aegean, rendering right from the beginning the version of a local origin doubtful.

Considering the uniqueness of this archaeological artefact, an analytical approach based upon mainly non-destructive or minimally destructive techniques was devised. The compositional characterization of the mould by means of optical microscopy (OM), scanning electron microscopy and microanalysis(SEM/ED), X-ray fluorescence analysis (XRF/ED), near infrared spectroscopy (NIR) and X-ray powder diffraction (XRPD) has so far enabled us to draw some preliminary conclusions about its possible provenance. The case of a local origin has at first been excluded, shedding more light on the casting procedures that took place for the manufacture of weapons during the Mycenaean period, as well as on the already attested active role of the Achaeans metal workshops within the trans-Adriatic technological exchange of the 12th century B.C., usually referred to as a “metallurgical koinè”.

4 A POSSIBLE LOWER KISHON ECONOMIC NETWORK DURING THE LATE BRONZE AGE

**Abstract author(s):** Martin Garcia, Jose (Universidad Pompeu Fabra) - Artzy, Michal (University of Haifa)

**Abstract format:** Oral

Tel Risim is a small site situated in the Jezreel Valley, ca. five kilometers west of the major site of Tel Shimron. Salvage excavation projects in the area unearthed remains dating from the Early Bronze to the Roman and even later periods. In 2006, in one of the salvage excavations, a team directed by W. Atrash of the Israel Antiquities Authority discovered in a Late Bronze Age structure several Cypriot imports and locally produced ceramics. Among them are sherds attributed to the Plain White Wheel Made Ware (PWWM) family, a production technology that is not common to the Jezreel Valley but to Cyprus.

To understand from where and how did the PWWM ceramics arrived at Tel Risim, we offer a comparative study of these ceramics with the ones discovered at a survey and excavation in the adjacent area of the Southern Plain of Akko. Based on this data we propose that the PWWM ceramics found at Tel Risim arrived from the anchorage site of Tell Abu Hawam ca. 15 km northwest. The PWWM reached Tel Risim via donkey caravans and barges following the Kishon River while passing through the archaeological sites of Tel Nahal and Tel Regev. Additionally, Tel Risim was on the route continuing inland to Tel Shimron and was somehow dependent on it. While it seems that the economic relationship of the sites situated along this route was more than merely commercial, we assume

that they operated as a unified economic network.

5 UNDERSTANDING LOCAL AND REGIONAL MOBILITY IN CENTRAL SARDINIA USING STRONTIUM ISOTOPE ANALYSIS

**Abstract author(s):** Holt, Emily - Madgwick, Richard (Cardiff University)

**Abstract format:** Oral

Strontium isotope analysis is increasingly used to understand mobility in archaeology. In places where the geology varies over small areas, strontium analysis can be used to help understand patterns of local and regional mobility. Recent work on Cyprus (Ladegaard-Pedersen et al. 2020) and Ireland (Snoeck et al. 2020) has shown the possibility of mapping strontium isotope baselines that reflect the varied geology of islands and that can aid in interpreting the results of strontium isotope studies of ancient human and animal remains.

As part of the Marie Curie project ZANBA: the zooarchaeology of the Nuragic Bronze Age, the authors have undertaken to build a strontium baseline map of central Sardinia. Central Sardinia was an important location for the development of the Bronze Age Nuragic Culture from earlier Eneolithic and Early Bronze Age groups. Additionally, several assemblages of human remains and some faunal remains from central Sardinia have been the subjects of previous isotope studies. These studies have focused on carbon, nitrogen, and oxygen, providing information about diet and climate but giving only minimal information about local and regional mobility. The creation of a strontium isotope baseline map for central Sardinia will provide a strong foundation for future research as well as opening the possibility of additional studies on previously tested remains. In this paper, the authors explore the potential of strontium mapping central Sardinia and introduce their efforts to begin building such a map.

6 MOBILITY, COLONIZATION AND RESILIENCE: TERRITORIAL DYNAMICS IN SOUTHEASTERN IBERIA BETWEEN THE LATE BRONZE AGE AND THE EARLY IRON AGE

**Abstract author(s):** Cutillas Victoria, Benjamin (University of Murcia)

**Abstract format:** Oral

Phoenician colonization of the southeast of the Iberian Peninsula has been considered one of the most influential factors in the development of the region from the 8th century BC. The interaction between autochthonous communities and colonial environments led to a period of territorial complexity and population growth that had a significant impact on inhabited landscapes with the creation of new local and Phoenician settlements. However, these dynamics were already incorporated in a trend that began two centuries earlier with incipient contacts with Atlantic and Mediterranean trade networks and the new configuration of territories. The foundation of settlements and the inception and organization of productive and economic local systems during the Late Bronze Age amplified the possibilities of the region and helps to explain the Phoenicians’ interest in settling on this coast.

These cyclical changes are not only visible on the macro-spatial level, but they also have a visible impact on the intra-site processes of the habitats. Adaptation to these new situations caused the settlements to modify their urban structure and, furthermore, there were spatial transfers within the same environment. These processes implied an important micromobility with the abandonment of some sectors and the construction of others, including in these works the construction of new defensive systems such as in Castellar de Librilla. The objective of this paper is to present a renewed analysis of the territorial dynamics characterized by cultural encounters that occurred in this region, including a multiscale approach that examines the colonial and native dynamics of local and regional mobility. This cross-sectional point of view reflects the resilience exerted by these communities in order to overcome new sociopolitical and cultural conjunctures.

394 THE URBAN ARCHAEOLOGY COMMUNITY NETWORK: URBAN ARCHAEOLOGY IN 2020

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Boi, Valeria (Central Institute for Archaeology - MiBACT) - Belford, Paul (Clwyd-Powys Archaeological Trust) - Bouwmeester, Jeroen (Rijksdienst voor het Cultureel Erfgoed)

**Format:** Discussion session (with formal abstracts)

After the 2017 conference in Maastricht, the Urban Archaeology community was founded. This is a platform for urban archaeologists in Europe to meet and discuss recent issues and developments in Urban Archaeology. Since then the group has met twice at EAA conferences in Barcelona and Bern, and at our own interim meeting in Rome. At the Bern meeting the group mentioned a desire to discuss recent issues at the conferences alongside other activities like interim meetings, a newsletter and our website www.urbanarchaeology.org. This session will be the main session of the Urban Archaeology Community at the Budapest conference.

In this session we would like to address the first objective: to create an overview of urban archaeology in 2020.

Next to the results of archaeological research we especially would like to focus on the praxis of doing research on Urban Archaeology. What are the challenges you meet doing this, and how did you, if you could, resolve these? How were you able to meet research objectives within the constraints of time and money? How did you involve the public and the politicians and developers? And finally – and maybe the most important question for the community as a network – how can we help each other dealing with all these issues?

The organisers invite shorter or longer contributions which may more or less formal presentations, but hope to have an open and



ABSTRACTS

1 INTRODUCTION: URBAN ARCHAEOLOGY IN 2020

**Abstract author(s):** Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

**Abstract format:** Oral

This is already our second session after we established ourselves as an EAA community in Barcelona 2018. We have been meeting each other at conferences but also at an in-between meeting in Rome. This is all about what we as organisers of the community wanted it to be. A place and platform to meet and to talk to each other about urban archaeology. Last year’s meeting was about what we, as a community, would like to do and achieve. One very important aspect was to hear from each other about ‘what is happening’ on urban archaeology in Europe and beyond. This could be about carrying out excavations in the highly dynamic urban environment, but also about methods how to excavate urban sites. This led to this year’s session of the community: a network session to hear from each other new ideas and be inspired! This is also why we published our first book on urban archaeology. A book to inspire and a community to inspire. We hope this session will lead to new and further directions of our community within a rapidly changing world. In the introduction I will reflect upon the results of earlier sessions and the themes from the book as a starting point of the session. The themes are:

- challenges around preserving archaeological remains in situ;
- pressures on time, resources and funding;
- competition with many other public interests – better transport, new housing, more tourism;
- new techniques in modelling, researching and excavating urban sites;
- increasing pressure from politicians, funders – and from archaeologists themselves.

2 ADJUSTING MALTA: THE QUESTION OF PUBLISHING ARCHAEOLOGY

**Abstract author(s):** Pintucci, Alessandro - Abbadessa, Angela (Confederazione Italiana Archeologi)

**Abstract format:** Oral

The Valletta Convention has been and is at the center of the international debate: if it is common opinion that the Convention represented a radical change in the nature of our discipline, inserting it in the field of activities related to territorial and urban planning, it is also known that there are a number of negative aspects that are a direct result of the introduction of this legislation: alongside an excessive bureaucratization of archaeological procedures, the most discussed outcome is the progressive decrease of the elaborative aspect of archaeological studies and the very low propensity for scientific publication of rescue and preventive excavations.

The general consequence is a progressive transformation of archeology into technical knowledge, serving construction sector, which is now rarely opposed (in this sense the Anglo-Saxon term development-led archeology is perfectly fitting). In addition to not producing enough knowledge, archeology risks being seen, on the one hand, as the last defense against land consume (perhaps noble function, but certainly improper with respect to the purposes of the discipline), more often as a practice as avoidable as possible, with laws aimed at reducing the interventions of archaeologists to the bare minimum.

The archaeologists’ response is normally to claim a golden age that never existed, which risks resembling more a war against wind-mills than concrete actions.

We want to beat another path, starting from the analysis of the reasons for these changes, to arrive at a proposal to bring research back to the centre of the interest of archeology, restoring dignity also to preventive and rescue excavations.

Starting from known experiences, a proposal will be formulated that is able to combine the principles of Malta (polluters pay), with the market mechanisms, which is now clear, is not able to include the phases of research, study and publication.

3 BEST PRACTICES FOR THE MANAGEMENT OF PREVENTIVE ARCHAEOLOGY IN URBAN AREAS. DATA COLLECTION, PUBLICATION AND REUSE

**Abstract author(s):** Boi, Valeria - Fichera, Maria Grazia - Mancinelli, Maria Letizia - Negri, Antonella (MIBACT) - Gabucci, Ada - Ceci, Lucia - Ventura, Sabina (Freelance archaeologist)

**Abstract format:** Oral

The construction of new infrastructures, especially for multi-layered urban areas, is a unique opportunity to reveal new details on their history and, at the same time, represents a risk for the stratigraphic contexts, threatened by the evolution of the modern city.

The application of the law on preventive archaeology, regulated in Italy on the basis of art. 25 of Legislative Decree 50/2016, Public Procurement Code, helps to limit the risks for the archaeological heritage by allowing an evaluation of the projects of public works before their approval, and the realization of archaeological excavations before the starting of the works. At the same time, however, the effectiveness of these procedures can be greatly reduced by the difficulties in obtaining high quality data on the areas investigated.

For this reason, the Central Institute for Archaeology (ICA) of the Italian Ministry of Culture is realising the “National archaeological

geoportal”, which will serve as a “central hub” in which information coming from different sources can be integrated and from which it can be accessed by institutions, scholars and professionals.

With the aim of making it more useful and efficient, a working group made up of representatives of the Directorate-General of Archaeology, Fine Arts and Landscape (DG-ABAP), The Central Institute for Archaeology (ICA) and the Central Institute for the Cataloguing and Documentation (ICCD), has developed a GIS template which will be adopted for the recording of data by the professionals in charge of the archaeological excavations, in order to allow their registration in a quick, simple and standardized way and their semi-automatic processing until the publication on the National Geoportal.

4 WHEN ARCHAEOLOGICAL PRACTICES ARE THE BEST POSSIBLE SOLUTION TO URBAN PROBLEMS

**Abstract author(s):** De Davide, Claudia (Akhet srl)

**Abstract format:** Oral

What happens when you work in a little historical town with few major roads and there is a need for lots of new infrastructure? As in many other Italian cities, in this last decade the city of Aosta, north-west of Italy, was characterized by the imposition of different types of infrastructure, from a new urban central-heating system to an innovative optical fiber.

Every project, initiated by private companies, is declared to the local council as being of «very low impact because they don't go too deep». But in reality these new infrastructure impact on a subsoil that is already occupied by numerous other services; in a small city it can be really over-crowded. It could happen that finding a location for a new pipe-system in the first meter below the actual ground-surface becomes a real challenge, and the presence of archaeology is only another part of the problem.

The in-depth documentation of the subsoil is one of the characteristics of an archaeological approach, especially when it is related to cities with long historical records. Knowing this, what would happen if we change our point of view and we start to use this approach for the benefits of a total-mapping of the subsoil and not only for archaeological purposes?

5 INSIDE AND OUTSIDE CITIES. AN INTEGRATED SYSTEM FOR MANAGING URBAN AND EXTRA-URBAN ARCHAEOLOGICAL DATA

**Abstract author(s):** Gattiglia, Gabriele (University of Pisa - Dipartimento di Civiltà e forme del sapere) - Anichini, Francesca - Campus, Antonio (University of Pisa - MAPPA Lab)

**Abstract format:** Oral

MAPPA is a system for managing, analysing, visualising and publishing urban archaeological data. The first version was developed in 2012 for estimating the archaeological potential of Pisa, Italy. This version has been tested and consolidated over the years. Now MAPPA is going ahead crossing new challenges. The first has been to optimise the data entry. The MAPPA system has been re-engineered joining RDBMS and GIS function on the same web-based environment, so allowing a faster updating. All kind of archaeological data from single context to anthropology, from findings to excavation areas, can be easily added.

The second challenge is to study the relationships between city and district, their mutual influences and transformations over time or in a specific age, extending the MAPPA classification system beyond the urban area, recording the landscape as well as small towns and villages. To do that, we are working on different territories in the North of Tuscany.

The third challenge is facing the problem of managing urban archaeological data related to a big metropolitan area. Responding to this, a new project “MAGOH (Managing Archeological data for a sustainable GOvernance of the Heritage)” will start in March 2020 collecting the data of Florence. Due to the need of working with archive documents and grey literature, MAGOH project will develop also tools both for the semi-automatic digitisation of the data and semi-automatic extraction of the information based on Named Entity Recognition (NLP technology). Both tools will then be included in the MAPPA system improving its effectiveness.

6 UNEARTHING A VANISHED GREEK CITY: THE CASE OF OLD SIKYON

**Abstract author(s):** Mùth-Frederiksen, Silke (National Museum of Denmark) - Kissas, Konstantinos (Ephorate of Antiquities at Corinth)

**Abstract format:** Oral

The ancient polis of Sikyon, Corinth’s western neighbour on the north coast of the Peloponnese, has always been well-known from literary sources as an important player on the political and economic scene and as a famous centre of arts and crafts, particularly in Archaic and Classical times. In 303 BC, however, Sikyon was conquered and destroyed by the Macedonian king Demetrios Poliorketes, who re-established it on a better-defensible site nearby. The ruins of the old city disappeared gradually under the surface until even its location fell into oblivion. In 2015, a collaborative project of the National Museum of Denmark, the Ephorate of Antiquities in Corinth, the Institute for Geosciences of the University of Kiel (Germany) and the Danish Institute at Athens was set up in order to locate and investigate the Archaic-Classical site. In the two initial field seasons, archaeological and geophysical surveys, geological augerings and remote sensing were employed to determine the location of the old city within a larger area and gain first insights in its topography and structure. In three following excavation seasons, selected structures were explored in detail in order to analyse aspects of the urbanistic development and material culture of the city. This paper will discuss the various difficulties faced in the process of investigating a whole ancient city in an area partly covered by modern settlements and partly used intensively for agriculture. The present-day natural and infrastructural conditions, advantages and issues of the individual research methods including

various disciplines, and organisational and administrative issues of an international collaboration will be addressed. Moreover the results obtained until now will be presented, containing important information on the shape, culture, crafts and development of Old Sikyon.

7  
**BRINGING THINGS INTO PERSPECTIVE - A NEW APPROACH TO UNDERSTANDING MEDIEVAL URBANIZATION OF CENTRAL SWEDEN**

**Abstract author(s):** Kjellberg, Joakim (Department of Archaeology and Ancient History)  
**Abstract format:** Oral

The study of medieval urbanization in Sweden have previously been dominated by spatial theories and methodology. The plethora of everyday objects and mass-materials encountered in the medieval towns have rarely been integrated in the urban research of the region apart from in stratigraphic and chronological analysis of different sites. In my soon to be finalized PhD project at Uppsala University I have been studying the overall development and establishing of the townscape as well as how changes in the urban networks are reflected in the archaeological assemblages of the different households within the towns. By taking a comparative and integrated approach to both the artefact assemblages as well as the spatial development a new insight have been gained into the process of urbanisation in the region. In this presentation I will introduce the project and address some challenges and results as well as to point to some areas in need of further investigation.

8  
**EXCAVATING CEMETERIES IN AN URBAN CONTEXT : DIFFERENT CONSTRAINTS FOR DIFFERENT ISSUES**

**Abstract author(s):** Wermuth, Elodie - Lambert, Aurore (Eveha; UMR 7268, Aix Marseille Univ, CNRS, EFS, ADES, Marseille)  
**Abstract format:** Oral

Nearly 30 years of French developer-funded archaeology has generated a significant number of urban excavations. The re-generation of cities and urban environments allows the excavation of smaller surfaces with large stratigraphies, requiring adapted methodologies. The urban context also has several particularities : urban activities around the dig, co-activity with the developers, neither spatially nor temporally exhaustive excavation. These constraints become more apparent when excavating parish cemeteries, as problems specific to funeral archaeology - the management of tombs in sepulchral space and the characterization of the buried population – require a particular archaeological approach.

Between the 15th and 18th centuries, funeral practices were diverse but burial patterns are standardized - mostly individual inhumation burials with coffins and shrouds -. Tombs are often numerous, densely organized spatially and stratigraphically, and very disturbed. In addition, it is necessary for all human remains to be removed from the site. These factors – diverse practices, standard patterns, and thorough removal – require a treatment protocol that maximizes the data and the amount of burials that can be documented within a limited time-frame, yet still respects the individual. The protocol requires the fine recording of a sample of burials and their contents, with accelerated excavation and streamlined recording of the non-bone corpus.

- Three recent excavations illustrate the approach we have developed and their constraints :
- Saint-André les Vergers : rehabilitated forecourt of the church, context of monitoring works involving the excavation of waste-water networks only.
  - Reims "Place Museux": rehabilitation of the square adjoining the church, context of fragmented urban excavation, and a quantity of burials six times greater than estimated.
  - Paris "Carreau du Temple": rehabilitation of a hall without destruction of the building, context of excavation in co-activity, with the archaeological prescription focusing on the Templar cemetery but not the modern parish cemetery.

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**SPECULATIVE ARCHAEOLOGY: CREATING METHODOLOGIES**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Organisers:** Beck, Anna (Museum Southeast Denmark) - Shanks, Michael (Stanford University) - Svabo, Connie (Roskilde University)  
**Format:** Discussion session (with formal abstracts)

Archaeologists work with remains to construct accounts and narratives, to author papers and exhibitions, to build knowledge. In this, archaeology is a creative field of cultural production, of design practice and making. Acknowledging speculation as essential to this process, with this session we aim to address the potentials and constraints of an archaeology that specifically brings the speculative to the centre.

Using the term speculative with reference to speculative design (Dunne and Raby 2013), we want to address speculative archaeology as experiments with alternative worldviews, presenting plausible, possible and preferable alternatives to orthodox paradigms, stretching our archaeological imaginations in cultural commentary, critique and intervention, building prototypes for future archaeologies. In this way, speculative archaeological studies can offer thought-provoking archaeological accounts that give new understandings of the past, counterposed to the reassertion of orthodox evolutionary and ethnic narratives we are currently witnessing in the discipline - and in the end, challenge the understanding of just what the past was, is and might be in the future.

We invite contributions of any kind (case studies, statements, provocations) to discuss archaeological practices in relation to a broader cluster of human and social science research methodologies that give priority to the generative, creative and constructive aspects of knowledge creation. The cluster of creative methodologies includes research through design, constructive design research, research-creation, arts-based research, practice as research, performance as research. Common to these methodologies is that they highlight the creative and generative aspects of research and give priority to ‘doing’; to explorative and iterative processes of ‘trying things out’, as part of the production of knowledge. A shared conviction is that knowledge is created through dynamic integrations of ‘making’ and ‘reflecting’. How will this shape modes of knowledge production, mediation and dissemination as well as temporal, spatial and material perspectives in a speculative archaeology?

**ABSTRACTS**

1  
**SPECULATIVE DESIGN - AN ARCHAEOLOGICAL INTERVENTION IN GRAECO-ROMAN ANTIQUITY**

**Abstract author(s):** Shanks, Michael (Stanford University)  
**Abstract format:** Oral

My contribution to this session on (archaeological) methodology and methods is two contrasting scenarios from my ongoing research in the archaeology of Graeco-Roman antiquity. They will offer a disciplinary, indeed historical context for the argument that archaeology is creative productive practice. The scenarios will track some key changes in disciplinary landscapes since the 1960s: socio-cultural modeling; pragmatics and reflexivity; the cultural politics of identities past and present; agency and materialism; heritage agendas in cultural memory; a reassertion of old and familiar metanarratives. The session invokes a vital homology between knowledge building and design, conceiving speculative archaeology as experiments with alternative worldviews, presenting plausible, possible and preferable alternatives to orthodox paradigms, stretching our archaeological imaginations in cultural commentary, critique and intervention. The scenarios will manifest how I continue to work to such ends: speculative design of pasts-in-presents under a redemptive aesthetic, that what is needed is not the preservation of the past but the redemption of hope.

2  
**SPECULATIVE REALISM AND HISTORICAL REALISM: A COMPARISON**

**Abstract author(s):** Ribeiro, Artur (Christian-Albrechts-Universitat)  
**Abstract format:** Oral

Speculative Realism entered archaeology in full force some years ago, built upon the philosophy of the Speculative Realist group, which comprised scholars such as Graham Harman, Quentin Meillassoux, Ray Brassier, Iain Hamilton Grant, Levi Bryant, Ian Bogost, and Timothy Morton. Despite the popularity of Speculative Realist philosophers, a cursory look into their work reveals that most of them do not actually refer to or even apply speculative methods. In fact, many of the philosophers within the Speculative Realism movement do not even support each other’s work.

The term ‘speculative’ is a confusing one because depending on who you are reading, different definitions will emerge: in some cases, ‘speculative’ refers to a distinct form of Hegelian dialectics, whereas in other cases, ‘speculative’ refers simply to the act of conjecture. Additionally, the term ‘realism’ is also referred to quite spuriously, with little to no connection to the realism/anti-realism debate of the 1980s and 1990s.

Perhaps a more interesting discussion can be found not in philosophy, but rather in Historical Theory, namely that of Carlo Ginzburg and Hayden White. For these two thinkers, the aim of history is not truth but possibility and reality. Given the fragmentary nature of the past, either in the form of memory, historical sources, or the archaeological record, it seems clear that we cannot uphold universal truths about that very past. Thus, it makes sense that what is needed is a verisimilar perception of the past, one built on the conjecture of what events could have occurred and what past actors could or could not have done in their socio-historical contexts.

3  
**SPECULATIVE APPROACHES WITHIN CONTRACT ARCHAEOLOGY - DISCUSSING THE PRODUCTION OF 'RESULTS' IN EXCAVATIONS**

**Abstract author(s):** Beck, Anna (Museum Southeast Denmark)  
**Abstract format:** Oral

Contract archaeology can be characterized as one of the most concrete and set types of knowledge production in archaeology. With a framework defined by international and national legislation, the aim is rather inflexible; the investigation methods are often standardized; and the end product is mostly given by bounded formats as the excavation report, scientific reports and entries into central databases. Furthermore, the expenses of the archaeological investigations within contract archaeology are in many countries funded by the individual developer, not by the state.

With a critical view, my claim would be that there is a risk that the structure of contract archaeology as it is constituted today creates a sort of ‘obligation’ to produce tangible and manifest results. Therefore, excavation results within contract archaeology are often presented to the public as hard data, actual finds and interpreted in relation to well-known culture-historical narratives but at the same time leaving out elements of wonder, doubt and ambiguities. The question is what would happen to the perception of the ‘excavation result’ if speculative and creative approaches were more explicitly included into the process of contract archaeology than they are today.

With inspiration from speculative design and a background in studies of knowledge production in Danish contract archaeology, I will discuss an alternative contract archaeology where speculation plays a central role; a contract archaeology which produce results that is challenging existing knowledge and which engage with both possible, plausible, probable and preferred past as well as futures (Dunne & Raby 2013). In other words, a contract archaeology which – rather than producing new answers – aims at producing new questions.

4 **FIRST FOODS FOR THE FUTURE: USING ZOOARCHAEOLOGY TO REIMAGINE INDIGENOUS FOODWAYS IN WILLAPA BAY, WASHINGTON**

**Abstract author(s):** Antoniou, Anna (University of Michigan)

**Abstract format:** Oral

Community-driven archaeology provides the materials and actions by which communities can imagine their past and spark debate and discussion about how past practices may inspire a healthy, culturally rich, and sustainable future. This paper presents a case study of zooarchaeology conducted with the Shoalwater Bay Indian Tribe in Willapa Bay, Washington and highlights the creative ways the community is using research (both the process ‘doing’ research and the data it generates) to drive health and wellness initiatives, assert sovereignty, and reinvigorate Indigenous foodways. Through targeted excavations of household shell midden deposits and analyses of the faunal assemblage at a late prehistoric and protohistoric Chinook and Lower Chehalis village, this work demonstrates that Chinook and Lower Chehalis peoples depended upon numerous local marine resources and establishes a historical precedent pertinent to the descendant communities’ negotiations for legal rights to culturally relevant food sources. Using these archaeological investigations as a catalyst, the Shoalwater Bay community is turning to the knowledge of their ancestors so that their descendants may have a more prosperous tomorrow. I present some of the ways the community is doing so, including first food celebrations, adult nutrition courses that draw on ancestral food practices, and community-owned museum exhibits. I argue that when archaeology is done in tandem with descendant communities and driven by their interests and needs it becomes more than the data it generates. It is transformed into a creative and speculative process by which Indigenous communities can explore their history on their own terms and craft possible futures that bring culture, health, and wellness to the forefront.

5 **ARCHITECTURAL DESIGN AS A METHODS FOR ARCHAEOLOGICAL KNOWLEDGE PRODUCTION**

**Abstract author(s):** Lengyel, Dominik - Toulouse, Catherine (BTU Cottbus-Senftenberg)

**Abstract format:** Oral

Archaeology mediates its knowledge essentially through verbal descriptions accompanied by illustrations. As language offers a multitude of verbal – and drawings the complementary graphical – possibilities to express uncertain knowledge from obvious over probable to plausible, the uncertainty often remains unresolved. In architecture on the contrary, uncertainty that arises during any design phase of a building project, is object to spatial and visual proposals. The modelling method of abstract geometrical volumes suggest the presence of buildings in alternatives while the use of photographic methods raises spatial imagination. Both methods are traditional within architecture referring on their history and experience. As soon as archaeological hypotheses contain uncertainty, the architectural design practice offers experimental ways to find abstract designs for the making and reflecting of speculative representations creating a consistent yet uncertain narrative. This creative field of cultural production leads to thought-provoking proposals that challenge the understanding of the past as they show the generative design idea behind archaeological finds. This builds the bridge to today’s architecture. Design as a practice of research therefore creates knowledge for a broader cluster of sciences.

The presentation aims to demonstrate and illustrate this prototype of method by several projects developed by the authors in cooperation with archaeological research institutions:

- Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral),
- Bern Minster, its first century (by order of and published by Bern Minster Foundation)
- The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOI, exhibited as part of Sharing Heritage, the European Cultural Heritage Year 2018),
- The Palatine Palaces in Rome (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin),
- The Ideal Church of Julius Echter (by order of the Martin von Wagner Museum in the Würzburg Residenz combining physical models, auto-stereoscopy and VR experience).

6 **WORKING AT THE KNOWLEDGE/COMMUNICATION-BOUNDARY**

**Abstract author(s):** Svabo, Connie (Roskilde University; RUCMUS Museum Partnership)

**Abstract format:** Oral

Invoking SPECULATION in Archaeology, with inspiration from speculative design, is an invitation to enter a methodological playground of communication; to work creatively in the boundaries between knowledge and communication, by engaging with various kinds of mediation, working with fictional forms, thought experiments and make-believe.

Invoking speculative design in engagements with the past, opens up for interrogations of how disciplinary knowledge (for example from archaeology and history) forms part of the communication and cultural production which is carried out by museums. What

does knowledge consist of? How is it circulated, mobilized, actualized? Where do audiences, users and publics fit into knowledge production and communication?

From my position as a senior researcher at a university and my role as research coordinator of a Danish university-museum partnership, I am interested in inquiring into the boundaries between the knowledge practices of archaeology (and history) and museum practices of communication. My soft thesis is that the demand on museums (at least in a Danish context) to increasingly orient themselves towards audiences (publics) may lead to a reconfiguration of what archaeological and historical knowledge is at these museums.

Perhaps a classical, disciplinary understanding of knowledge will be supplemented by a pragmatic and participatory understanding of knowledge?

Perhaps changes will occur to what it means to do museum based research in archaeology or history. What we understand as research and knowledge may change, so that audiences are explicitly engaged in knowledge creating practices. Knowledge creation and communication are then no longer separate, but intertwined.

A chosen form of knowledge creation is also a chosen form of communication. A chosen form of communication is also the choice of potential modes of engagement. Such choices constitute audiences, senders and receivers. Such choices constitute both knowledge and public.

7 **WILD SPECULATIONS: FUTURE(S) OF ARCHAEOLOGY MATERIALISED THROUGH PERFORMANCE AND FICTIONING**

**Abstract author(s):** Tuominen, Suvi (University of the Arts Helsinki)

**Abstract format:** Oral

My space vessel lands on the surface of the earth and I step out. The gravity here is different than in the third colony, my spine can sense it. I watch the sky through which I came from, only to discover that the blue colour hides behind dense, pink clouds. These clouds orient my body toward archaeological objects that float above migrating birds. The movement of the birds and the floating objects together form a choreography of lines that constantly seek new accelerations and new modes of connecting the material play with different temporalities. Perception becomes dispersed. Where to gaze? What to search? Who to look for? How to perform archaeology in this graveyard of failed designs?

This paper looks into a possible hybrid performance methodology that seeks to connect features of science fiction, archaeology and choreographic practices. The author considers archaeology as a carnal practice where the psycho-somatic body constantly fictions (does) archaeological knowledge together with various non-human and inanimate agents. These doings are the core of speculative processes where the bodies of the archaeologists are open to contingencies. However, the possibility of bodily contingencies reduces as gadget designs and technological innovations are also restraining our bodies and affects. What type of methodology resists such development and how to materialise it beyond its conceptual abstraction? The hybrid methodology proposed by the author aims to reveal how ‘wild’ speculations about future(s) of archaeology can be materialised through performing and fictioning things differently in the present.

8 **THE AMBIVALENCE OF ARCHAEOLOGICAL PHANTASMS: THE MONUMENTUM ANCYRANUM AS A SPECULATIVE SPACE**

**Abstract author(s):** Dikkaya, Fahri (TED University)

**Abstract format:** Oral

In conventional archaeological discussion, interpretation of a space is determined by the desire to discover a meaning in archaeology. Meaning of space in different periods or time dimensions are close to associated with relativity of archaeological knowledge. Memory and historicism dominate description of the space and create authority or power over speculative interpretations persistently. In this context, the archaeologist is both the controller and the intervenor in that process, veering between acting as the determinator of the descriptive context and the designator of the functional context. Continuous modification of interpreting function and identity in association with space further recreates space as a series of architectonic entities with different temporalities. Thus, space is described through discontinuity, displacement and transformation. This paper will focus on the changing space, identity and interpretation of the Augustus Temple (The Monumentum Ancyranum with the text of Res Gestae Divi Augusti) in Ankara, Turkey. How function, perception and identification of space that contains this temple was modified in different political and religious periods in antiquity and in common era? How do these modifications relate to one another? How do we recognize speculations of different periods on the past uses and identifications of the area in which the Temple was located?

9 **ARCHAEOLOGICAL FINDS, NONPLACES AND CONSTRUCTED UNREALITIES. WHAT IF THE CLEAR INTERPRETATION IS UNCLEAR**

**Abstract author(s):** Dabal, Joanna (University of Gdansk)

**Abstract format:** Oral

This paper is an introduction to theory of interpreting archaeological finds in context of mind games. Small project has been taken to proceed understanding of archaeological finds excavated at Wislouwscie Fortress site. This architectural monument has been a



theatre for dozens of stories, those with significant meaning for city history and those individual. The main goal of taken actions was to express what we know about the past places by finds. This seem to be easy when we conclude about general stories but when we looked up into details, many questions arise and even simple statements becoming unclear. Do we need those details? Are we satisfied with general stories? What if we just generalizing the past, does individuals mean anything in the background of the past?

In context of "massrecords archaeology" where are the basic answers? This paper is to discuss interpretation process and aims with use of speculative figures of nonplaces and constructed unrealities. Some abstract, virtual installations has been created for this purpose to confront them and their efficiency with conventional methods.

10

APPROACHING THE MATERIALITIES OF SILENCE AND ABSENCE

**Abstract author(s):** de Vos, Julie (Aarhus University)

**Abstract format:** Oral

Looking for traces of Francoist repression and violence at marginalized and undocumented detention centers and concentration camps based in reused old buildings in the rear-guard province of Ávila (Spain) has forced me to reconsider my methodological approach to this kind of civil war sites. Restricted access, absence and silence made me realize that my search for physical traces was in vain. Instead, I had to figure out a way of comprehending the sites and the silence that revolved around them with their non-absences and ghosts of place. The blurred lines between theory and method resulted in a sort of just ‘doing’, a blend of physical engagement and theoretical reflection in the field.

In this paper, I argue that it is not always possible to apply conventional archaeological methods to unconventional places. Some places are too significant though, to just ignore or give up on, but if conventional methods are not an option, other kinds of engagements are required in order to grasp and expose a place and its ghosts. By focusing on the material manifestations of absence and silence, other kinds of archaeological knowledge is produced.

400

LATE NEANDERTHALS OF THE MIDDLE DANUBE BASIN IN CENTRAL EUROPEAN CONTEXT: CULTURAL VARIABILITY, INTERREGIONAL CONTACTS, DEVELOPMENTAL CAPACITIES [PAM]

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Mester, Zsolt (Institute of Archaeological Sciences, Eötvös Loránd University, Budapest) - Lamotte, Agnès (UMR 8164 du CNRS, HALMA, University of Lille) - Wiśniewski, Andrzej (Institute of Archaeology, University of Wrocław)

**Format:** Regular session

The unique geographic position of the Middle Danube basin in the heart of Europe has made it a meeting point of climatic, biogeographical, as well as cultural areas. Crossing the basin, the Danube River links together the Balkans and Central Europe, providing a northwest-southeast migration route for animal and human populations. On the other hand, the basin is connected with the northern and eastern plains by mountainous passes and river valleys across the Carpathians. The archaeological record demonstrates a colourful image of the Late Neanderthals in the region from the Eemian to the Interpleniglacial (MIS 5e–3, ca. 140–30 ka BP): the Taubachian with small tools, the different Mousterians, the Micoquian, the industries with foliate pieces, as well as the assemblages with volumetric blade production. All these units could be related to cultural complexes spread over the Europe, like the microlithic tool industries, the Mousterian facies, the Keilmessergruppen, and the Blattspitzengruppen, the laminar phenomenon. Looking for answers about the origin and this cultural diversity, we will discuss the role of following aspects:

- the adaptation and the different subsistence strategies of human groups in a varied and changing environment during the climatic oscillations of the last glacial cycle;
- the mobility and the communication networks of the groups, resulting in the exchange of ideas and goods over long distances;
- the capacities of the Neanderthals to acculturation or to produce innovations toward behavioural modernity, resulting in “transitional industries”.

For a better understanding of different aspects of mentioned problems, general synthesis, analysis on a regional or interregional scale, and case studies are welcome. We appreciate theoretical and methodological contributions too, as well as case studies from neighbouring regions for comparison.

ABSTRACTS

1

NEW CHRONOLOGICAL DATA ON THE LATE MIDDLE AND EARLY UPPER PALAEOLITHIC NORTH TO THE MORAVIAN GATE

**Abstract author(s):** Wisniewski, Andrzej (University of Wrocław) - Moska, Piotr (Institute of Physics – Centre for Science and Education, Silesian University of Technology, Gliwice) - Bobak, Dariusz - Połtowicz-Bobak, Marta (Institute of Archaeology, University of Rzeszów)

**Abstract format:** Oral

MIS 4 and especially MIS 3 have been seen as a critical period for the disappearance of a population of Neanderthals and spreading

out of anatomically modern humans (AMH) in central Europe. Until recently, reliable data concerning the chronology of this process in the area located north to the Sudetes were missing. This presentation aims to show a new chronological record filling existing research gaps. To test this question, the optically stimulated luminescence method (OSL) was applied. The samples were taken from 5 open-air sites attributed traditionally to the Middle- and Early Upper Palaeolithic. As a result, almost 30 dates were obtained, which place the phases of occupation between 60 and 35 kyr.

Our research shows that the late Middle Palaeolithic sites should not be younger than 50 – 48 kyr as opposed to the EUP sites, which can be dated to a period between 48 – 35 kyr BP. Excluding dating from sites subjected to intensive post-sedimentation processes, this range should be limited to a few thousand years. New research did not provide data confirming that transitional industries (EUP) could have survived to the late MIS 3. This work was financially supported by the National Science Centre, Poland (grant number 2017/25/B/HS3/00925).

2

CIEMNA AND OBŁAZOWA CAVE SITES. THE STRATIGRAPHIC FRAMEWORK OF THE CULTURAL CHANGE IN LATE MIDDLE PALAEOLITHIC

**Abstract author(s):** Ciesla, Magda (Institute of Archaeology Jagiellonian University) - Stefanski, Damian (Archaeological Museum in Kraków) - Valde-Nowak, Paweł (Institute of Archaeology Jagiellonian University)

**Abstract format:** Oral

The two archaeological sites of Ciemna Cave and Obłazowa Cave, both situated in southern Poland have yielded so far a large number of Middle Palaeolithic artefacts. On each of the mentioned sites, the presence of late Neanderthals is marked with several levels of occupation. The techno-typological variability is well marked between the different stratigraphic units, and visible links with surrounding geographical regions make it clear that Neanderthals, even though they exploited mainly local area, also had a notion of more distanced territories. The analysis of the use of raw materials shows, that Kraków-Częstochowa Upland, where Ciemna Cave is situated, and the Podhale region, where Obłazowa Cave is, were both used by same groups or at least, that settlement in both areas was linked in some way. The presentation of the stratigraphic framework of the cultural changes on both sites might cast a new light on our understanding of Middle Palaeolithic in Central Europe.

3

VARIABILITY OF LEAF POINT INDUSTRIES IN THE CSERHÁT MOUNTAINS: RAW MATERIAL USE AND TYPOLOGY

**Abstract author(s):** Zandler, Krisztián (University of Szeged) - Markó, András (Hungarian National Museum) - Péntek, Attila (Independent researcher)

**Abstract format:** Oral

In this presentation three assemblages, documented in relatively well preserved startigraphic sequence will be discussed. Vanyarc, Szécsénke and Galgagyörk are lying in the same region. The common points of the lithic assemblages are the presence of leaf shaped implements associated with Middle Palaeolithic tools and the extralocal raw material types on one hand and the absence of Upper Palaeolithic type blade reduction or the characteristic retouched forms on the other one.

The assemblages are dominated by leaf shaped points (Vanyarc), side-scrapers (Galgagyörk) and end-scrapers made on thick flakes (Szécsénke). The raw material spectra are very different ranging from the absolute dominance of regionally available rocks (Szécsénke, more than 95%) to the high number (more than 600 pieces reaching one third of the lithic artefacts) of the metarhyolite imported to the site from nearly 100 km (Vanyarc). The raw material procurement of Galgagyörk is the most colourful with the presence of extralocal obsidians in small quantity and local basaltic andesites in the vicinity of the site.

As a result of the excavations, we documented three in situ preserved Middle Palaeolithic assemblages belonging to the leaf point industry (Blattspitzenindustrie), but showing different behaviour. We interpret the artefact-bearing layer from Galgagyörk as reflecting the traces of a ‘pioneering’ human group using the poor quality rocks (basaltic andesite), suggesting that no information about the raw material sources was available. The Vanyarc site document the regular (yearly?) moving of human groups along the mid mountain range over a distance of 100 km, and finally, at Szécsénke a regional landscape use/long term occupation in the area.

All three sites has been used in the same time period (between 50-40 k years) and corresponding with the Moravian Szeletian sites (Vedrovice V, Moravsky Krumlov IV.) according to direct and indirect OSL dates and tool tipology.

4

THE MIDDLE PALAEOLITHIC BÁBONYIAN OF NORTH-EAST HUNGARY IN THE LIGHT OF THE RECENT EXCAVATION OF THE EPONYMOUS SITE AT SAJÓBÁBONY

**Abstract author(s):** Mester, Zsolt (Institute of Archaeological Sciences Eötvös Loránd University) - Salvador, Pierre-Gil (University of Lille, EA 4477 CNRS, TVES, UFR Géographie et Aménagement) - Szolyák, Péter (Herman Ottó Museum) - Ringer, Árpád (Foundation for the Szeleta Culture) - Lamotte, Agnès (University of Lille, UMR 8164 CNRS, HALMA, Bâtiment de Géographie)

**Abstract format:** Oral

In the early 1980s, Árpád Ringer recognized a Middle Palaeolithic industry, characterized by bifacial tool production, including leaf-shaped elements, belonging to the Micoquian complex of Central and Eastern Europe. He named it Bábonyian after its richest site, Sajóbáony-Méhész-tető. Since the Bábonyian is considered as the possible ancestor of the Szeletian in Hungary. Two excavations were carried out at Sajóbáony in 1986 and 1997. These works unearthed a rich knapped stone industry, thousands of artefacts,

embedded in a brown forest soil. This palaeosoil was suggested to be as old as the Last Interglacial (Eemian, MIS 5e). Despite these investigations a lot of questions remained open at the site. To look for answers a very good opportunity has been provided by the archaeological mission project “Le Paléolithique de la Hongrie” funded by the French Ministry for Europe and Foreign Affairs. This French-Hungarian research project involves 17 specialists of prehistoric archaeology and geosciences from the University of Lille, the Natural History Museum in Paris, the University of Lyon (France), as well as from the Eötvös Loránd University in Budapest, the Herman Ottó Museum in Miskolc, and the University of Miskolc (Hungary). The project has various objectives which aim, for a first quadrennial, to improve our knowledge about the site. The new excavations from 2019 to 2024 provide new data for clarifying the chronostratigraphic position of the industries and the role of taphonomic site formation processes, and for reconstructing the palaeoenvironmental context of the human occupations. The detailed technological and typological study of the lithic assemblages, including the old collections, will be completed by use wear analyses, for reconstructing technical behaviour, cultural traditions and subsistence activities of the prehistoric human groups. Here we present the first results of the 2019–2020 excavation seasons.

5 **TYOLOGICAL AND TECHNOLOGICAL STUDY OF BIFACIAL LEAFPOINTS AND TOOLS FROM MIS 5-3 OPEN AIR SITES IN NORTHEASTERN FRANCE**

**Abstract author(s):** Desmadryl, Thomas (University of Lille) - Feray, Philippe (INRAP) - Lamotte, Agnès - Tuffreau, Alain (University of Lille)

**Abstract format:** Oral

Open air sites from the late middle Palaeolithic (MIS 5 through 3) excavated during the past 40 years in northern France have yielded lithic industries dominated by flake production strategies with high variety during the Early Glacial. Bifacial tool types such as leaf-point, handaxe, bifacial scraper and Pradnik knives exist in a small number of sites and as a minority inside archaeological levels. But in the eastern department of Haute-Saône, open air sites regularly show close association of flake production, retouched mousterian tools, leafpoints and varied bifacial tools including backed bifaces. Geographically, both regions are northern and southern entry point into westernmost Europe for East-West migratory flux. Through scar pattern analysis, we describe technological makeup of these tools and investigate the reality behind the typological classification of leaf points and other bifacial tools. Backed bifaces, leafpoints and other types of bifacial tools are more common in central and eastern Europe thus we look into possible Neandertal migration and importations in northern France Mousterian lithic industries during the last stages of the Middle Palaeolithic.

6 **GEOMETRIC MORPHOMETRICS, SHAPING AND TECHNOLOGICAL ASPECTS OF LEAFPOINTS FROM TWO EPONYMOUS SITES : SAJOBABONY AND SZELETA CAVE, HUNGARY**

**Abstract author(s):** Lamotte, Agnes - Monnet, Claude (University of Lille) - Mester, Zsolt (Universtity of Elte)

**Abstract format:** Oral

Although commonly used to analyze hominin and animal bones, 2D and 3D geometric morphometrics has only recently been applied to understand the variability of Paleolithic stone tools. This method is well-known and has already been applied to numerous sites yielding bifaces from the Acheulean in Africa and Eurasia and from the Mousterian. In addition, the method of the technological reading of knapped stone artefacts is frequently used for lithic analysis in Paleolithic research. In Central Europe, both analytical approaches were applied separately for studying bifacial leaf-shaped tools. Therefore, we propose to combine them for a more complex understanding of these tool types. In Hungary, leafpoints are characteristic tools of the Bábonyian and the Szeletian industries of the Middle Paleolithic and the Middle to Upper Paleolithic transition respectively. According to the actual state of research, the Bábonyian is considered as the direct ancestor of the Szeletian in northern Hungary. Last year, a French-Hungarian research program has been launched for studying the Bábonyian problem. In this framework, we analyze leaf-shaped artifacts found on the eponymous sites: at Sajóbáony-Méhész-tető during our recent excavation and former field works by Á. Ringer and B. Adams, as well as in the Szeleta Cave during old excavations. We want to open a discussion concerning the evolution of leafpoint production by late Neanderthals of the region.

7 **TO THROW OR TO CUT? AN EXPERIMENTAL APPROACH ON SZELETIAN LEAFPOINTS**

**Abstract author(s):** Pyzewicz, Katarzyna (Institute of Archaeology, University of Warsaw) - Nemergut, Adrián (Institute of Archaeology, Slovak Academy of Sciences, Nitra) - Grużdź, Witold - Migal, Witold (State Archaeological Museum in Warsaw)

**Abstract format:** Oral

The aim of the research is an investigation of Szeletian leafpoint technology and function. In our studies, we applied experimental and use-wear analyses. The investigated lithic material comes from an archaeological site in Moravany nad Váhom-Dlhá (by L. Zotz, later by K. Absolon and J. Bárta). The characteristic features of the assemblage are poplar-leaf shaped points (Moravany-Dlhá type), which are numerous in the collection and exhibit various sizes and shapes. The differentiation of bifaces reflects selected stages of production, usage and reparation.

The first phase of the analysis was focused on the experiment. It began with an investigation of the assemblage – both preforms and flakes from the reduction process. We noted the possible stages of production and débitage techniques. Later on, we produced a series of leafpoints from radiolarites and flints that resembles morphologically materials from Moravany-Dlhá and finally we used them in a series of actualistic experiments connected with cutting, throwing and hafting.

The next stage was a use-wear analysis of Moravany-Dlhá leafpoints. In our interpretation of leaf points, we compared them to our

experiments and the data presented in the literature. Our studies focused on showing the relations between the morphology of points and the character of macroscopic and microscopic traces associated with the usage and hafting.

Based on the results of our experiments and microwear analysis of leafpoints from Slovakia we would like to outline the issues related to bifacial technology and hunting strategies of Palaeolithic groups. Our investigation exhibits that leafpoints Moravany-Dlhá were used as projectile points of the throwing weapon. Additionally, a lot of the technological features resemble Upper Palaeolithic technologies rather than Middle Palaeolithic one.

The paper was supported by grant VEGA 2/0101/19: „Technology and economics of raw materials in the context of the development of Postpaleolithic lithic stone industries in Slovakia”.

8 **RE-EXAMINATION OF THE SUBALYUK NEANDERTHAL REMAINS (SUBALYUK CAVE, HUNGARY)**

**Abstract author(s):** Pálfi, György (Department of Biological Anthropology, University of Szeged) - Pap, Ildikó (Department of Anthropology, Hungarian Natural History Museum, Budapest) - Tillier, Anne-marie (PACEA CNRS UMR 5199, Université de Bordeaux) - Szigeti, Krisztián (Sемmelweis University, Department of Biophysics and Radiation Biology, Budapest) - Molnár, Erika (Department of Biological Anthropology, University of Szeged) - Rosendahl, Wilfried (Reiss-Engelhorn-Museum, Mannheim) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History; Institute for Archaeological Sciences, University of Tübingen) - Posth, Cosimo (Department of Archaeogenetics, Max Planck Institute for the Science of Human History; Institute for Archaeological Sciences, University of Tübingen) - Maixner, Frank - Zink, Albert (Institute for Mummies and the Iceman, EURAC European Academy, Bolzano)

**Abstract format:** Oral

In 1932, skeletal remains of two Neanderthal individuals, a young adult female and a 3-4 year-old child, were discovered in Subalyuk Cave in North-Eastern Hungary. The results of the anthropological examination were published some years after this important discovery (e.g. Bartucz, 1940). As in the second half of the 20th century numerous Middle Paleolithic human remains were discovered, a detailed re-examination was carried out 25 years ago (Pap et al., 1996).

New methodological progresses encouraged new re-examinations during the last some years. Radiocarbon dating revealed an age of 39,650-38,610 cal BP (2 Sigma) for the adult female, and 34,487-33,286 cal BC (2 Sigma) for the child. Paleopathological studies of these Neanderthal remains revealed distinct evidence of skeletal infections. Alterations of the sacrum of the adult specimen suggest probable early stage sacroillitis, while several vertebral bodies indicate superficial osseous remodelling of infectious origin. Small erosive lesions and abnormal blood vessel impressions were observed on the endocranial surface of the child skull, reflecting a reaction of meningeal tissues, possibly a consequence of some infectious/inflammatory process.

Next-generation sequencing (NGS) of the female individual, combined with DNA enrichment, revealed a low covered mitochondrial genome unambiguously assigning the skeleton as Homo neanderthalensis. This first paleogenetical result from Hungarian Middle Paleolithic human remains, the paleopathological observations and the new radiocarbon dating provide new insights into the place of the Subalyuk remains among the European Neanderthal sample.

The support of the Hungarian NKFIH K125561 Grant is greatly acknowledged.

Bartucz, L. (1940) Der Urmensch der Mussolini-Höhle. – In: Bartucz, L., et al.: Die Mussolini-Höhle (Subalyuk) bei Cserépfalu. – Geol. Hung. Ser. Paleontol. 14: 49-105.

Pap, I. et al. (1996): The Subalyuk Neanderthal remains (Hungary): a re-examination. Annls hist.-nat. Mus. natn. hung. 88: 233-270.

9 **3D RECONSTRUCTION OF NEANDERTHAL CHILD’S SKULL OF SUBALYUK (HUNGARY)**

**Abstract author(s):** Coqueugniot, Helene (UMR 5199 PACEA - Universiy of Bordeaux-CNRS; Ecole Pratique des Hautes Etudes, PSL University Paris) - Mellado, Nicolas - Barthe, Loïc (Institut de Recherche en Informatique de Toulouse, Université Toulouse III – Paul Sabatier) - Tillier, Anne-marie (UMR 5199 PACEA, Universiy of Bordeaux-CNRS) - Dutour, Olivier (Ecole Pratique des Hautes Etudes, PSL University Paris; UMR 5199 PACEA - Universiy of Bordeaux-CNRS) - Palfi, Gyorgy (Department of Anthropology, University of Szeged) - Pap, Ildiko (Hungarian Natural History Museum, Budapest)

**Abstract format:** Oral

Paleoimaging has revolutionized archaeological sciences in general and paleoanthropology in particular. Without damaging original fossil specimens and even without handling them, it is now possible, thanks to new methodologies in image processing, to access their internal structures, to correct taphonomical distortions, to share this data with scholars all around the world and to print in 3D all or part of this fossil material. This approach provides new information of growing interest to the scientific community.

The goal of this presentation is to bring new insights into the growth processes of Neanderthal children through the 3D reconstruction of the child’s skull discovered in 1932 in Subalyuk cave in North-East Hungary (Bartucz, 1940). Fossil remains of this infant, aged around 3 years old at death (Pap et al 1996) was found with adult skeletal remains. In order to correct the complex taphonomic deformation of the child’s skull, specific algorithms were implemented. This allowed to propose a new reconstruction of what his/her original skull shape might have been.

It is now possible to assess the morphometric variability of Subalyuk child within that of other fossil children of the same dental age and therefore to better document the growth patterns among Neanderthals.



Bartucz, L. (1940) Der Urmensch der Mussolini-Höhle. – In: Bartucz, L., et al.: Die Mussolini-Höhle (Subalyuk) bei Cserépfalu. – Geol. Hung. Ser. Paleontol. 14: 49-105.

Pap, I. et al. (1996): The Subalyuk Neanderthal remains (Hungary): a re-examination. Annls hist.-nat. Mus. natn. hung. 88: 233-270.

LIPID BIOMARKERS FOR TUBERCULOSIS ARE PRESENT IN NEANDERTHAL SKELETAL REMAINS FROM SUBALYUK, HUNGARY

**Abstract author(s):** Minnikin, David - Lee, Oona - Wu, Houdini (University of Birmingham) - Llwellyn, Gareth - Williams, Christopher (University of Swansea) - Pap, Ildikó (Hungarian Natural History Museum) - Pálfi, György (University of Szeged) - Maixner, Frank - Zink, Albert - Jaeger, Heidi (EURAC)

**Abstract format:** Oral

Studies of two Neanderthal individuals from Subalyuk (Hungary) showed bone lesions that could be associated with tuberculosis. A young adult female had an age of 39,650-38,610 BP and a 3-4 year-old child was somewhat younger at 34,487-33,286 BP. Bio-markers, such as aDNA and characteristic lipids are increasingly effective in the diagnosis of the ancient mycobacterial diseases, tuberculosis and leprosy. Specific tuberculosis lipids are particularly robust, being detectable in published studies up to 17ka BP in a bison, correlating well with bone lesions and aDNA amplification. The particular lipids used are C70 – C90 mycolic acids, analysed by fluorescence high performance liquid chromatography (HPLC), and C27 – C32 mycocerosic acids, profiled using gas chromatography mass spectrometry (GC-MS). The specimens analysed were sacrum and vertebra specimens from the adult female and cranium and vertebra from the child.

In comparison with a Mycobacterium tuberculosis standard, very weak and indecisive mycolic acid profiles were recorded for the adult and child vertebrae and the child cranium. In contrast, the child vertebra and cranium specimens proved clear diagnostic signals for C32 mycocerosic acid, accompanied by lesser amounts of the C30 component. The adult vertebra showed only a very weak indecisive peak for C30 mycocerosate and no lipid biomarkers were discernible in adult sacrum samples. The detection of C32-mycocerosate in the juvenile is a positive indication of infection by members of the M. tuberculosis complex (MTBC). In the late Pleistocene, extensive bone lesions suggest the presence of tuberculosis in a range of megafauna, Bison priscus metacarpals being the most conclusive. Gravel pits in the area of Pest County (Budapest) are yielding bison metacarpals with definitive tuberculosis lesions up to a least 100ka BP, but not later than 10 – 20 ka BP. Pleistocene megafauna could well have passed tuberculosis on to co-existing Neanderthals.

IMAGE-BASED 3D-DOCUMENTATION – NEXT LEVEL OF DATA STORAGE IN DIGITAL ARCHAEOLOGY

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Hostettler, Marco (Institute of Archaeological Sciences, University of Bern) - Drummer, Clara (Institute for Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel/ CRC 1266 Scales of Transformation) - Emmenegger, Lea (Archäologischer Dienst des Kantons Bern) - Reich, Johannes - Stäheli, Corinne (Institute of Archaeological Sciences, University of Bern)

**Format:** Discussion session (with formal abstracts)

Digital Archaeology and Image-Based 3D-Documentation have become widespread in archaeological everyday practice. Despite its relevance, a common ground for storing and archiving the massive datasets produced by 3D-Documentation is still missing: What needs to be archived? Who needs access to data? What are current solutions? What are long-term challenges?

These pressing questions arose during the EAA annual meeting 2019 in Bern and need urgently to be discussed in more detail.

This round table will tackle these challenges in an interdisciplinary discussion with participants not only from the archaeological field, but also from digital archives and other institutions dealing with long-term data storage. The aim is to clarify the following points:

- the needs for the storage of 3D-related data like reproducibility and compatibility
- the challenges of archiving (data amount, data format, access, digital long-term storage)
- current available solutions focusing on 3D-data.

Part of the discussion will draw from a survey on the needs and current solutions in European archaeology. The survey will be conducted in the first half of the year 2020.

The planned outcome of this interdisciplinary round table is a joint publication on these 3 topics. We invite researchers of all disciplines that are working with Imaged-Based 3D-Documentation, who have encountered one of these topics and are willing to contribute their experience and knowledge to take 3D-Documentation to the next level.

ABSTRACTS

THE USE OF 3D DOCUMENTATION IN BROAD-CONTEXT STUDIES OF ARCHITECTURE ON THE EXAMPLE OF TETZCOTZINCO, MEXICO

**Abstract author(s):** Prusaczyk, Daniel - Juszczuk, Karolina (University of Warsaw)

**Abstract format:** Oral

3D documentation and modeling are now one of the basic tools for archaeological research, especially analyzes of architectural remains. Computer-generated images give archaeologists a wide field for technical or stylistic research, but at the same time they still cause numerous "logistic" problems.

Techniques such as 3D-scanning, 2-D and 3-D photogrammetry formed the basis of our research project on the site of Tetzcotzinco, a remnant of a monumental garden and architectural complex, that covers 17,6 hectares, from the Aztec era. The combination of modern technologies allows us to develop a number of issues (including research on construction technique, or solve reconstruction problems) without destroying archaeological remains, and lets us transfer research "from the field to the computer".

At the same time, the amount of material (generated during the scanning of large-scale structures) and still faulty software generate problems that archaeologists have not faced in the last decades.

The purpose of our participation in the discussion is to raise the problem of storing and publishing the results of 3D modeling. We would also like to discuss possible ways of using metric data or 3D based projections in the architectural analysis. Another interesting issue may be solutions related to combining three-dimensional models with GIS technology and discussing the future of such methods in broad-context research in the field of landscape archeology or history of architecture.

USE OF 3D DOCUMENTATION IN THE STUDIES OF THE ANDEAN CEREMONIAL LANDSCAPE PRE-COLUMBIAN ORACLE APU COROPUNA

**Abstract author(s):** Sobczyk, Maciej (Center for Precolumbian Study University of Warsaw) - Ćmielewski, Bartłomiej (Laboratory of 3D Scanning and Modeling, Wrocław University of Science and Technology) - Siemianowska, Sylwia (Centre for Late Antique and Early Medieval Studies, Wrocław, Institute of Archaeology and Ethnology Polish Academy of Sciences)

**Abstract format:** Oral

The Nevado Coropuna (Peru) is surrounded by numerous archaeological sites. This mountain was mentioned many times by Spanish chroniclers and documents (Pedro Cieza de León, Phelipe Guaman Poma de Ayala, Cristóbal de Albornoz). authors mention the temple of Nevado Coropuna. According to our research, this place was the monumental site now known as Maucallacta-Pampacolca (over 50 hectares). It was founded at an altitude of between 3,600 - 3,800 meters above sea level.

Maucallacta contains more than 250 stone buildings, well adapted to the unevenness of the terrain, are characterized by their large dimensions - with a rectangular floor plan - and spatial planning in sets - that surround the squares. Among the tools used in the research, remote sensing techniques were found with different effectiveness. Because of that, some comparison was performed to check the spatial accuracy of architectural elements, vertical accuracy of terrain reconstruction obtained by classical survey, terrestrial and aerial (UAV): photogrammetry, lidar.

Photogrammetry documentation:

- data from digital photogrammetry is in the form of jpg, depends on which object but from 3 to 15GB photos.
- then processed in a photogrammetric project in the Agisoft Metashape program ( up to 200GB) products from this are mainly orthophotomosaics and 2 files related to the area (terrain models) in the format: dsm and dtm - sizes 1-4GB single positions.
- or if it is a building, 3D models of buildings obj, mtl, jpg , models and textures up to 1GB.

Lidar documentation:

- binary files regarding the trajectory in the txt file (drone - 75MB, station on the ground 23MB, txt trajectory about 22MB)
- file from the scanner in the pcap format, here about 2-3GB.
- a point cloud in the format: las - about 2GB

The basic storage disk has 16TB.

SURVEY ON THE CURRENT USE AND APPLICATION OF 3D-TECHNOLOGY FOR ARCHAEOLOGICAL AND CULTURAL HERITAGE PURPOSES

**Abstract author(s):** Hostettler, Marco (Institute for Archaeological Sciences, University of Bern) - Buhlke, Anja (Freelancer) - Drummer, Clara (Institute for Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel, CRC 1266 Scales of Transformation) - Emmenegger, Lea (Freelancer) - Reich, Johannes - Stäheli, Corinne (Institute for Archaeological Sciences, University of Bern)

**Abstract format:** Oral

Digital archaeology and image-based 3D-documentation have become widespread in archaeological everyday practice. Despite its



relevance, a common ground for storing and archiving the massive datasets produced by 3D-documentation is still missing. Aims, applications and strategies are diverse, as are software solutions.

To get an insight into the current use and the application of image-based 3D-documentation a survey among practitioners was conducted. The survey was spread through brad channels and conducted online. The aim of the survey was to address the following main-questions:

- How is image-based 3D-technology used and applied?
- What solutions and practices are in use concerning the archiving of 3D-data?
- What are the needs for a sustainable and reliable application of 3D-technology?

The survey reached more than 70 contributions from a range of different countries from practitioners working with image-based 3D-technology. Preliminary results seem to confirm a broad range of different applications, different programs and different data management approaches.

#### 4 BALANCING DATA STORAGE AND USER FUNCTIONALITY: THE 3D AND ARCHAEOLOGICAL DATA STRATEGY OF THE TRACING THE POTTER’S WHEEL PROJECT

**Abstract author(s):** Hilditch, Jill - Opgenhaffen, Loes - Jeffra, Caroline (Universiteit van Amsterdam)

**Abstract format:** Oral

Tracing the Potter’s Wheel (TPW) is a multiyear project which has generated a reference collection of 3D models of archaeological and experimental ceramics for its research goals. The project acknowledges its responsibility to invest in stable, sustainable, and functionally-appropriate platforms for storing and presenting our data. For the past two years, TPW has grappled with designing relational and contextually-rich data storage for 3D models and their associated information, particularly both metadata and paradata. To ensure that long-term, open access to data is maintained, we have developed a number of solutions, both within our team and through student-driven investigations. As the project comes to a close, digital archives of the archaeological and experimental data have been designed, tested, and prepared for launch.

TPW’s focus has now turned toward understanding the current landscape of digital archiving of 3D resources and establishing an appropriate repository for these data which can foster further research by future scholars. This stage requires weighing options between the range of already-established data platforms, the necessity for cost-effective solutions, and the unique nature of the data. Out of the intersection between data requirements and goals for functionality, TPW has struck a balance which is a useful case study for others tackling similar issues. Although a major goal is to assure stability of data storage, the project weighs this against the drive to make the data accessible – 3D data is exceptionally useful as a means to simulate intensive object study in the field. By explicitly integrating data sharing alongside data storage, TPW has forged a strategy where any data management solutions must accommodate known project objectives alongside unknown requirements of future users.

#### 5 3D CONTENT IN EUROPEANA: THE CHALLENGES OF PROVIDING ACCESS

**Abstract author(s):** Fernie, Kate (2Culture Associates)

**Abstract format:** Oral

Europeana is an online platform that provides access to millions of items of digital content from Europe’s museums, galleries, libraries, archives and research institutions. Although 3D documentation has become more common in recent years, the majority of the content accessible via Europeana comprises of images and text documents. In 2019 a task force was established to identify ways of making 3D content more accessible to users of Europeana’s platform. The creation of highly accurate 3D models of monuments, buildings and museum objects has become more widespread in research, conservation, management and to provide access to heritage for education and tourism. Yet this is still a developing field and organisations that are commissioning 3D media need to make a series of choices on the type of content that is created, how it will be visualised online and for which users. The challenges of storing and providing access to this content include the multiplicity of content types and formats, the technology requirements and limitations faced by different audiences, and issues such as low standardisation, the complexity and volumes of data involved, interoperability, and lack of metadata.

The approach of the 3D content in Europeana task force was to gather information to investigate how 3D content is being implemented for cultural heritage. It gathered and analysed information about the 3D data types, file formats, viewers and other means of publishing 3D content online, emerging approaches for documentation, metadata and content streaming. The task force made a set of recommendations for Europeana and its network, which includes a call for action to work collaboratively in developing standards for 3D content formats, metadata and interoperability with the aim of improving access, storage and preservation of 3D media.

#### 402 THE IMITATION GAME: INVESTIGATING THE WHO, WHAT, WHY, WHERE AND WHEN OF IMITATIVE COINS

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Wigg-Wolf, David (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts) - Vida, István (Hungarian National Museum) - Moesgaard, Jens (Stockholm Numismatic Institute, Stockholm University; CRAHAM, UMR 6273 CNRS/ Université de Caen)

**Format:** Regular session

Imitation”, “Copy”, “Nachahmung”, “Barbarisierung”, “Limesfalsa” are just some of the terms used to describe a widespread numismatic phenomenon: that a coinage in some way imitates or references another coinage. However, whereas in the past numismatists have often had a very undifferentiated, even simplistic view of them with negative connotations, “imitations” are in fact a many-splendoured thing.

Even if it is generally the iconography that defines a coin as an ‘imitation’, coins themselves are a fusion of material, image and text, so that the legend, the metal or the denomination can also be significant. This complexity is further reflected in their ambivalent roles: on the one hand coins are official products of a central administration, on the other hand objects of everyday social, ritual and economic circulation.

In contrast to the antiquarian approaches of the past, modern contextual numismatics provides new insights that see the phenomenon as more than mere imitation or simple appropriation. The reasons for adopting or adapting aspects of coinages of other polities or groupings can be diverse: they could have been ‘official’, made by a government, perhaps during a crisis; be made by others as a criminal activity; or by persons wishing to emulate the benefits of having their own monetary system. They could also be objects that translate certain meanings and connotations of coins, such as power, wealth and representation; in their new context they could enjoy a very different, often non-monetary function, for example as jewellery or an emblem. They could give rise to novel, new creations.

The session will thus consider examples of the manifold forms of transformation from ‘original’ to ‘final product’ from the ancient and medieval world, from a wide range of geographical contexts.

#### ABSTRACTS

##### 1 IMITATIONS OF ROMAN REPUBLICAN DENARII FROM THE NATIONAL ARCHAEOLOGICAL MUSEUM IN SOFIA, BULGARIA

**Abstract author(s):** Dotkova, Miroslava (National Archaeological Institute with Museum Sofia)

**Abstract format:** Oral

The work presents several imitations of Roman Republican denarii from the numismatic collection of the National Archaeological Museum in Sofia. Some of the coins are single finds with unknown provenance, others are part of hoards with official republican denarii. They are easily identifiable, by the general aspects of their style and mostly by obvious differences that appear at their legends. The prototypes of these coins are republican denarii from the second half of the Second and first half of the First century BC, some are hybrid imitations. The most frequent prototypes are denarii struck by the Roman moneyers L. Thorius Balbus in 105 BC and C. Naevius Balbus in 79 BC. Coins are in good condition, but all of them have been in circulation. For the Bulgarian territory, these imitations are rarities and they are found mainly in northern Bulgaria, once the Roman province of Moesia Inferior. Most likely the denarii are not local production and arrived in the course of money circulation south of the Danube.

##### 2 THE SARMATIAN IMITATIONS: THE REINVENTION OF ROMAN COINS

**Abstract author(s):** Vida, István (Hungarian National Museum / Magyar Nemzeti Múzeum) - Juhász, Lajos (Eötvös Loránd University / ELTE)

**Abstract format:** Oral

Sarmatian coins denotes a small group of imitations that are primarily known from the Great Hungarian Plain. Due to their lack of representational qualities they are easily distinguishable from any other coins. Nonetheless, their relative uniformity portraying a very simple head on the obverse and usually lunate, stellar or floral motifs on the reverse makes them fascinating. They are pierced or looped, thus they were most likely worn as a decoration or an amulet. Their obverses were mostly modelled after 4th century Roman coins: the style of the tetrarchy and Constantinian dynasty is clearly recognizable, but their lunate and stellar reverses are truly genuine, their closest parallels are 2nd and 3rd century denarii.

Most striking is the idea that the Sarmatians, who did not use money in their everyday life, still took the effort of producing Roman coin imitations, but with very specific designs to meet their own needs as an ornament or protective charm.

3 BARBARIAN COPIES AND IMITATIONS OF ROMAN IMPERIAL DENARII. MANUFACTURING AND USE

**Abstract author(s):** Myzgin, Kyrylo - Dymowski, Arkadiusz - Bursche, Aleksander (University of Warsaw)

**Abstract format:** Oral

Roman Imperial denarii are abundantly found in the area of Barbaricum. Apart from silver coins from official issues, there are also quite frequent finds of items which were manufactured in barbarian workshops. These are both imitations as well as copies. Some of them were counterfeit specimens: plated denarii or denarii minted from silver-like alloys of base metals. Among these copies and imitations, the coins modeled on the Nerva-Antonine issues (AD 96-192) are definitely prevalent. There is a great variety of recorded denarii of these types. For now, basing on accessible numismatic and archaeological data we can only define possible workshops, find places or centers of production and to date the phenomenon (or phenomena) of manufacturing these coins. The main manufacturing center of barbarian imitations and barbarian copies should be located on the territory of present-day Ukraine, inhabited in the later phases of the Roman period by the population of Chernyakhiv culture. This is only one region in Barbaricum, where finds of such kind of denarii have been recorded in thousands. Furthermore, it is interesting that remains of workshops dealing with casting of copies of the Nerva-Antonine denarii with the use of silver-like alloys have also been discovered in the same area. Besides Ukraine, some imitative denarii have been found in Central Europe and in Scandinavia. It is proved that there are some die-links between barbarian imitations found in different regions of Barbaricum.

4 INDIAN IMITATIONS OF ROMAN COINS

**Abstract author(s):** Smagur, Emilia (Institute of Archaeology, University of Warsaw)

**Abstract format:** Oral

Just after the beginning of their inflow to India Roman coins started to be imitated at the subcontinent, however, two main phenomena can be distinguished. The first constitutes the production of imitations of Augustus and Tiberius denarii, being the cultural response to the influx of those coins to India. The second one is linked with the inflow of Imperial Roman aurei that were struck after Nero's reforms in 64 CE. The imitations of Roman solidi were also discovered in India. The main difference between those two occurrences lie in the economic value of imitations, and therefore, their function. At first they were mostly made of clay or base metal and were worth far less than their genuine silver counterparts. The quality of the metal – along with the weight of gold imitations of post-Julio-Claudian coins correspond to the value of contemporary genuine Roman gold coins.

The origin and functions of those specimens remain a debated issue. Double pierced examples confirm their use as jewellery items, however, it seems that at some point gold imitations might have been also used as a currency. This paper aims to discuss various types of Indian imitations of Roman coins (gold, silver and based metal imitations, clay bullae and bracteates), their geographical spread and chronological structure. The function and symbolic meaning of the Roman coin design in the new cultural context will be presented, as well as the local influences on its iconography.

5 FORGERY OF SERIES X SCEATTAS IN THE 8TH CENTURY EMPORIUM RIBE. WHY, WHEN AND WHO?

**Abstract author(s):** Feveile, Claus (Sydvestjyske Museer)

**Abstract format:** Oral

It is generally accepted, that sceattas of the Series X- type, the so called Wodan/Monster, were made in, or to be used at, the 8th century emporium in Ribe, South western Denmark. More than 280 sceattas, hereby 225 W/M, have been excavated as single finds in stratified layers, since the 1970ties. The small silver coins, ca. 1 gram, clearly states, that the emporium in Ribe was the first place in Scandinavia with a clear coin economy, however directly inspired by the coin using communities in North Western Europe.

Recently, at the Northern Emporium Excavation 2017-18, made in collaboration between UrbNet, Aarhus University, and Museum of Southern Jutland, a completely new aspect came to light: a few clay moulds from forging (?) Wodan/Monster-sceattas at a local metal work shop.

The paper will try to investigate the cause behind the small scale production: Why and when was it done? And who did it to what purpose?

6 ISLAMIC COINS (7TH-8TH CENTURIES) FROM THE EARLY MEDIEVAL SITES OF AZERBAIJAN

**Abstract author(s):** Seyidov, Abbas (UNEC Azerbaijan; Azerbaijan National Academy of Sceinces) - Ibrahimov, Kamil (“Icherisheher” State Historical-Architectural Reserve)

**Abstract format:** Oral

All societies are subject to substantial economic changes upon the appearance of money. Nominal weight, metal composition, legends including the name of a ruler and years of reign, and mint marks present valuable historical sources.

Arabs invaded Azerbaijan in the mid-7th century. During the Abbasid rule, Azerbaijan's mints issued gold dinars (denarius), silver dirhams, and copper fulus for their caliphal governors. The first gold dinars, silver dirhams, and copper coinage of the caliphate were minted as a result of the monetary reform carried out by the fifth caliph Abd al-Melik Marwan (685-705) in 696 CE (77 AH). Gold dinars were minted on the model of the Byzantine gold solid, silver dirhams in the form of Sasanian drachmas. By order of the Caliph, images on coins were prohibited; instead, the coins were decorated with verses – āyāt from the Koran.

After the conquest of the Sassanid state, Arabs adopted the Sassanid monetary system and began to coin silver dirhams modelled on the coins of the Sassanid rulers Khosrow II and Yazdigerd. As a result, coins acquired Muslim phrases – Bismillah, Alhamdulillah, La ilaha illallah, Allahu akbar, and Mohammed rasul Allah. Initially, those coins weighed 3 grams and contained a legend in Pahlavi, and later in Kufic Arabic. The small number of coins belonging to this period found during archaeological excavations indicate that the Caliphate coinage in Azerbaijan was imperfect in the second half of the 7th century. After the fall of the Caliphate, the Arab monetary system modelled as the basis for the currency circulation in the feudal states of Azerbaijan.

7 IMITATIONS OF THE FRENCH GUÉNAR 1385-1417/21, HOW, WHERE AND WHY?

**Abstract author(s):** Moesgaard, Jens Christian (Stockholm Numismatic Institute, Stockholm University; CRAHAM, UMR 6273 CNRS/Université de Caen)

**Abstract format:** Oral

The royal French base silver blanc called guénar was the main coin at the middle level of circulation in France during the larger part of the reign of Charles VI (1380-1422). Its popularity made it worth imitating for other mint authorities aiming at facilitating the circulation of their coins along with the official royal coins. In this way, they would get their part of the income linked to issuing coins. Thus the guénar was imitated in the county of Burgundy, in the duchy of Brittany, in the lordship of Rummen and by the English king claiming the throne of France. The status of these authorities varies greatly from a petty lord to a king. The degree of exact copying of the prototype varies from one to another of these imitations. This is a reflection of the various strategies of imitation of the involved mint authorities, which were, among other things, determined by the king's attitude to these mint authorities, as seen in the written sources (royal ordonnances). From this period, a large number of hoards survive, allowing us to see the part in the currency of each imitation, which reflects their success to penetrate into coin circulation. This survey of the imitations of the guénar will thus allow us to determine a range of imitative strategies and their efficiency.

8 WHAT IS AN IMITATION?

**Abstract author(s):** Wigg-Wolf, David (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts - RGK)

**Abstract format:** Oral

The concept of imitative coins covers a multitude of manifestations. This presentation looks at the concept in connection with coins and coin-like objects that in some way imitate or reference Roman coins, but which were produced outside the Roman Empire.

The Oxford Dictionary of English defines an imitation as “a thing intended to simulate or copy something else”. But to what extent do the objects in question fit this definition? Their roots in official Roman coins are quite recognisable: the head on the obverse, the variety of figurative designs on the reverse, and the legend are essential features. But the copies can be far removed from the originals in execution and style, and are immediately recognisable as such. And while they may simulate Roman coins in their appearance, they do not always do so in their function. Clearly some did have a monetary function, but others were pierced or mounted to be worn as personal ornaments, and although they will still have had monetary value, they were not primarily intended to be used as money.

The complexities of the relationship between these “imitations” and their Roman originals will be considered with reference to concepts such as appropriation, transformation and cultural translation.

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BIOARCHAEOLOGICAL PERSPECTIVES ON SOCIAL CHANGE DURING THE MIDDLE AGES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Garcia, Marcos - Alexander, Michelle (Department of Archaeology, University of York) - Ros, Jérôme (UMR 5554-ISEM, CNRS, Université de Montpellier)

**Format:** Regular session

The Middle Ages was a period characterized by cultural and economic transformations at multiple levels that fundamentally transformed societies after the collapse of the Roman Empire. Traditionally, historical research on these processes has paid particular attention to the emergence of new political powers or the main economic developments. However, this top down view can obscure transformations caused by population movements and immigrations, conquests and ‘reconquests’ and contacts and exchanges between different ethnic, religious or cultural groups (i.e. social changes).

Archaeological approaches to understanding the shaping of the medieval world have gathered increased interest over the last decades due in part to the new importance of the role played by bioarchaeological techniques such as archaeobotany, zooarchaeology and biomolecular analysis. Bioarchaeological studies often focus on the domestic economy, that is less often approached by traditional historical research. This session aims to bring together researchers who have an interest in the analysis of medieval period from a bioarchaeological perspective and whose studies contribute to the understanding of the main role played by social changes. Topics that might be addressed include:

- Transitions into the Post-Roman period.
- Role of socio-economical changes in food and agricultural dynamics.
- Application of new bioarchaeological techniques or a critique of present applications.
- Integration of comparative approaches (bioarchaeology, archaeology, textual sources).

1 MORPHOLOGIC AND ARCHAEOZOOLOGICAL EVIDENCES OF LIVESTOCK EVOLUTIONS IN LANGUEDOC DURING THE TRANSITION FROM LATE ANTIQUITY TO EARLY MIDDLE AGES

**Abstract author(s):** Mureau, Cyprien (Université Bourgogne Franche-Comté) - Forest, Vianney (Inrap) - Massendari, Julie (HADES)

**Abstract format:** Oral

This enquiry is an ongoing PhD research on an extensive, updated state of archaeozoological documentation about food habits and animal husbandry in Mediterranean Gaul from the 4th to 8th c. Numerous sites were recently discovered thanks to the development of archaeological survey in the Languedoc plain during the last decade. This surging late antique corpus has been broadened with new investigations rising in marginal areas, where exceptional settlements were discovered.

Based on about 80 000 animal remains from 34 settlements, this study will comprehend significant changes in food economy and husbandry practices which are noticeable from species frequencies, kill-off patterns or biometry. Sheep and goats seem to gain importance and the slightly increasing frequencies of young caprines may imply that they were more intensively bred for meat, while the proportion of bovine decreased, compared to the Roman period. Local specifics, though, were highlighted (such as bovine husbandry prevailed in Nîmes or the preference for pig along the Hérault river) and some food habits also suggest breeding systems adaptations to the environment of the settlements (exceptional proportions of goats on the Saint-Martin and Maguelone islands...).

Finally, the osteometrical study of animal bones did not only provide a general trend towards the decrease of their sizes and robusticity during the late Roman period, which is already well-known in Gaul for more than two decades, but also a complex variation of their morphology. Indeed, the reduction of bones would not be synchronous from one skeletal part to another and its intensity seems to be confronted with allometric biases, that height estimations and Log Size Index (LSI) methodologies cannot consider. Therefore, the analysis of these measurements enables us to identify the most suitable bones for following the evolution of domestic morphologies through time, and for even helping the datation of archaeological contexts in future.

2 ALL THE FISHES IN THE SEA? AQUATIC RESSOURCES CONSUMPTION IN SOUTH FRANCE DURING MEDIEVAL VILLAGE GENESIS

**Abstract author(s):** Mion, Leïa (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence)

**Abstract format:** Oral

In South of France, changes in rural settlement and use of lands were observed from the 8th century onwards. The dispersed communities began to gather around to form around the 9-11th centuries villages often reorganized around a church. This development is the result of a new social and agrarian organization impacting aquatic environments exploitation. The analysis of traditional carbon and nitrogen isotopes has been performed on subjects from two archeological sites dating from this period. They consist of two coastal rural settlements where this pattern of village genesis were recognized. The two of them are closed to rivers and ponds. The aim of this approach was to determine their inhabitants diet to discuss the impact of those social and economic changes on lifestyles.

The results showed that their protein diet was based on terrestrial animals. Marine resources despite the proximity to the sea were not regularly consumed. Freshwater resources seems to take a significant place in diet after the construction of the church. Fast religious traditions could be the reasons of this new dietary behavior. Access to aquatic resources was not equal inside the populations. Socioeconomic stratification was then impacting application of religious rules. The transformation of the organization of the settlement is so concomitant with a change in lifestyle and aquatic consumption.

3 BIOARCHAEOLOGICAL APPROACH TO MEDIEVAL AGRARIAN SOILS FROM ATLANTIC EUROPE (ASTURIAS, NW SPAIN)

**Abstract author(s):** Fernández Fernández, Jesús - Moshenska, Gabriel (University College London) - Martín Seijo, María (Universidade de Santiago de Compostela)

**Abstract format:** Oral

The agrarian archaeology during the Middle Ages has focused on the study of feudal communities and their economies going beyond the textual evidence. In this paper we combine a number of bioarchaeological approaches -charcoal and seed analysis, palynology, sedimentological and micromorphological data, physical and chemical tests, and radiocarbon dating- with archaeological evidence to study agrarian soils from two villages in Asturias, in the north of the Iberian Peninsula. These projects have explored medieval settlements, paying particular attention to productive areas like agricultural and cattle farming activities, using a multidisciplinary method. The results of the multi-proxy analysis summarised in this paper have shown a general picture with some indicators of agrarian activity and non-predicted information like the presence of firewood debris that indicates a system of fertilization based on household waste. From this perspective, we can characterize buried soils that would otherwise be understood based only on their stratigraphic and artefactual analyses. This method is useful to any kind of agrarian buried soil and has clear potential to improve agro-archaeological research agendas.

4 AN INTERDISCIPLINARY ANALYSIS OF THE IMPACT OF THE BLACK DEATH ON THE POPULATION OF MEDIEVAL CAMBRIDGE.

**Abstract author(s):** Inskip, Sarah - Robb, John - Rose, Alice - O’Connell, Tamsin - Dittmar, Jenna - Mitchell, Piers - Mulder, Bram (University of Cambridge) - Scheib, Christiana (University of Tartu; University of Cambridge) - Hui, Ruoyun (University of Cambridge) - Kivisild, Toomas (KU Leuven)

**Abstract format:** Oral

The Black Death is often viewed as a historical watershed in the lives of medieval people. The catastrophic loss of life is commonly characterised as resulting in changes in subsistence patterns, mobility, and bonds of serfdom ushering in a more prosperous 15th century. However, there has been little consideration of the biosocial effects of the plague, leaving its historical impacts on the ground often unknown. For example, did living standards actually improve? Did the epidemic change genetic structure? How long did the effects last for? The “After the Plague” project assess the impact of the Black Death on the inhabitants of Medieval Cambridge. Through multidisciplinary analysis of over 800 individuals from Cambridge and its hinterland, including isotopy, proteomics, genetics, osteoarchaeology and palaeopathology, biomechanics, archaeology and history, we assess patterns in genetics, health, and disease before and after the event. Results indicate a mosaic of both continuity and change and various parts of the community may have been affected differently. Through this case study, we discuss the benefits of integrated analyses and the perspectives that only archaeology can bring. Furthermore, we challenge ideas of looking for a ‘typical’ historical signature of an epidemic event; as disease events occur within a varied socio ecological network, outcomes could be highly regionalised or localised.

5 THE SOCIAL MEANING OF WILD ANIMALS IN MEDIEVAL SPAIN: A ZOOARCHAEOLOGICAL OVERVIEW

**Abstract author(s):** Grau-Sologestoa, Idoia (University of Basel)

**Abstract format:** Oral

Medieval zooarchaeology in Spain has experienced a remarkable boost during the last decade. Publications and conferences on specific topics such as medieval animal husbandry or foodways have become more common over the last few years. Although there is now a large body of zooarchaeological published site-reports, and despite remains of wild animals are often identified, archaeological perspectives on the relationship that Iberian people had with the wilderness during the Middle Ages are scarce. In this presentation, the evidence for hunting, fowling and fishing will be examined, as well as the rare presence of “exotic” animals, and discussed in relation to their social meaning in the medieval Iberian Peninsula. While the core of the presentation will be based on the available zooarchaeological evidence, written historical sources will be necessarily mentioned. Can the presence/absence of wild animals be used as markers for social, cultural or economic differentiation? In a diachronic perspective, is there any change in the way that natural resources were exploited? What are the possibilities and limitations of the evidence of wild animals for understanding the Iberian Middle Ages? These and other questions will be addressed in this presentation, with the aim of exploring the social meaning of wild animals in Spain during the medieval period.

6 CAUGHT IN THE NET: INTERPRETING A LATE MEDIEVAL WATER-SIEVED ASSEMBLAGE FROM A HIGH STATUS SETTLEMENT IN HUNGARY

**Abstract author(s):** Gál, Erika (Institute of Archaeology, Research Centre for the Humanities) - Bartosiewicz, László (Department of Archaeology and Classical Studies, Stockholm University)

**Abstract format:** Oral

Systematic water-sieving (2 and 5 mm mesh sizes) was used for the first time at a medieval excavation at Esztergom-Várhegy-Kőbánya in northern Hungary. The method yielded an outstanding assemblage, containing previously unseen numbers of medieval bird and fish bones. The assemblage mostly represents 14th–15th century food refuse from the archbishop’s court. Among the remains of terrestrial animals domesticates dominated. The wild fauna was mostly represented by the small bones of brown hare and, among birds, partridge. These finds confirm that foodways in the archbishop’s palace were more modest than expected on the basis of its outstanding social status of its inhabitant and guests who may have been engaged in hunting.

The unexpectedly small contribution of large acipenserids and carnivorous fish species (catfish/wels, pike) to the material is consonant with the scarcity of high-status large game in the diet. Meanwhile, the material showed a statistically significant diachronic increase in cyprinid remains. Contemporaneous accounting books suggest that the archbishop’s kitchen may have increasingly relied on farmed carpfish. Sturgeons were a commodity sold by the archbishop’s estates but rarely consumed locally. Expensive pike was bought at suppressed prices, possibly related to the small size of individuals identified in the deposits. Increasing contributions by cyprinids and sterlet to the assemblage also coincide with the high relative frequency of their recipes in a sixteenth-century high-status cookbook. Our results indicate that “white meat”, provided by poultry keeping and fowling as well as fishing, was highly appreciated at this religious centre, but other luxuries were not evident in the diet.



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## ORGANIC RESIDUE ANALYSIS OF MEDIEVAL COOKING WARES FROM THE VILNIUS LOWER CASTLE: A GLIMPSE INTO THE CASTLE’S INHABITANTS’ DIET

**Abstract author(s):** Rusteikyte, Aukse (Vilnius University, History Faculty, Archaeology Department) - Brown, Sophie - Evershed, Richard (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Motuzaite Matuzeviciute, Giedre (Vilnius University, History Faculty, Archaeology Department) - Venckuniene, Sigita (National Museum – Palace of the Grand Dukes of Lithuania, Vilnius)

**Abstract format:** Oral

The Vilnius Lower Castle and the Palace of the Grand Dukes of Lithuania complex is without doubt the most valuable archaeological monument in Lithuania. It played a central role in the Grand Duchy of Lithuania as it was a residence of the grand dukes of Lithuania and kings of Poland, the political, administrative and cultural heart of the State. The unique artefacts and ecofacts, remains of buildings excavated during the archaeological investigations are inexhaustible sources which gives a rare opportunity to study the everyday life of the castle’s inhabitants: the grand dukes, courtiers, soldiers and other citizens during medieval times.

Even though the Vilnius Lower Castle and the Palace of the Grand Dukes of Lithuania complex has already attracted the attention of major researchers and has been the subject of copious studies, the most abundant group of artefacts - thousands of potsherds – until now has been scarcely investigated. In order to recover information about medieval ceramic vessels’ content a well-established protocols of organic residue analysis were performed and high concentrations of lipids were extracted. GC-FID, GC-MS, and GC-C-IRMS analyses let our collaborative team to identify organic biomarkers of various animal origin. Lipid extracts demonstrated a high concentration of degraded animal fats (palmitic and stearic fatty acids), thus allowing further probing of particular fat sources, by employing a compound-specific stable isotope approach.

Finally, during medieval times Vilnius became a home for people of various nationalities and confessions, therefore local, Eastern and Western cultural traditions thrived together. But can we see the impact of this cultural diversity on dietary practices by looking into bioarcheological data? In this study we will present insights into the Vilnius Lower Castles’ inhabitants’ diet during the medieval times by comparing biomolecular, archaeobotanical, zooarchaeological data and textual sources and discuss the perspectives of such research.

8

## A HOUSEHOLD ANALYSIS FROM THE MEDIEVAL CORINTH (11TH TO 14TH CENTURIES): USE OF SPACE AND DAILY LIFE

**Abstract author(s):** Ragkou, Katerina (Philipps University of Marburg) - Margaritis, Evi (The Cyprus Institute)

**Abstract format:** Oral

Domestic structures as functional spaces and the material culture associated with them provide firsthand information on the everyday of individual families, their economic activities and social behavior. This paper is focusing on the architectural remains and their material culture of non-elite households from the Medieval Corinth between the 11th and 14th centuries, a critical period which witnessed the transition from Byzantine to Latin rule. Its objectives are to explore the domestic use of space and examine the private life in the city of Corinth as demonstrated by everyday practices and economic activities. The ongoing research is based on the meticulous study of the architectural remains, pottery, coins and archaeobotanical data. This multidirectional analysis results in the reconstruction of past human activities within the domestic landscape and in the assessment of cooking practices and agricultural activities undertaken at both household and communal/ city level. This interdisciplinary approach will provide a diachronic understanding of the social developments and changes caused by the transition from Byzantine to Latin rule and how they affected the private life of the inhabitants of Corinth.

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## GENDER DIFFERENCES IN DIET AND LIFE CONDITIONS IN THE RURAL MUSLIM POPULATION OF LA TORRECILLA (GRANADA, SPAIN 13TH-14TH CENTURY AD)

**Abstract author(s):** Laffranchi, Zita - Charisi, Drosia - Jiménez Brobeil, Sylvia Alejandra (University of Granada) - Milella, Marco (University of Bern)

**Abstract format:** Oral

A traditional focus of bioarchaeology is the test for differences between sexes in physical activity, health, and relative access to food resources, and the possible link of these differences to forms of gender-based social differentiation.

Analyses based on single variables are however often inadequate to describe social differentiation in the past, especially regarding the multifaceted nature of gender differences in lifestyle. Here we apply a multivariate approach to explore possible gender differences in lifestyle (developmental stress and diet) in a rural Muslim population (N:97) from Torrecilla (Arenas del Rey, Granada, Spain -13th/14th centuries AD). To this aim, we analyse a suite of variables including  $\delta^{13}C$  and  $\delta^{15}N$  values from bone collagen, linear enamel hypoplasia, cribra orbitalia, as well as long bone shape and robusticity, and check for any association between these variables, sex, and age-at-death. Specifically, we address the following research questions:

- Do males and females differ in their access to food sources, exposure to environmental stressors, and physical activity?
- How do these results compare with published data from Medieval Muslim urban contexts?

Results highlight no differences between sexes in either  $\delta^{13}C$  or  $\delta^{15}N$ , enamel hypoplasia, and cribra orbitalia, whereas long bone

shape and robusticity data reflect a marked sexual dimorphism in this population. These results fit previous research on similar contexts, while contrasting with others.

Taken together, data on stable isotopes, enamel hypoplasia, and cribra orbitalia point to a lack of differences in diet and health between sexes at Torrecilla, while long bones shape and robusticity values suggest a variability possibly linked to both biological and biomechanical factors.

The present study demonstrates the usefulness of a multifaceted approach when addressing social differentiation in the past, and the variable expression of gender differences in lifestyle among the Muslim communities living in Medieval Spain.

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## AGRICULTURE PRACTICES IN BORDER AREAS: ARCHAEOBOTANICAL ANALYSIS FROM THE EARLY MEDIEVAL RURAL SETTLEMENT OF SENHORA DO BARROCAL (WESTERN IBERIA)

**Abstract author(s):** Seabra, Luís (InBIO-Research Network in Biodiversity and Evolutionary Biology//CIBIO- Research Center In Biodiversity and Genetic Resources - Faculty of Sciences/University of Porto) - Tereso, João (InBIO-Research Network in Biodiversity and Evolutionary Biology//CIBIO- Research Center In Biodiversity and Genetic Resources - Faculty of Sciences/University of Porto; Centre for Archaeology. UNIARQ. School of Arts and Humanities. University of Lisbon; MHNC - UP - Natural History and Science Museum of the University of Porto) - Tente, Catarina (Institute for Medieval Studies/NOVA School of Social Sciences and Humanities of Lisbon)

**Abstract format:** Oral

The fall of Roman dominance brought times of uncertainty over several areas of Europe, including the Western Iberia. After the Germanic kingdoms, Muslims established a new power in most Iberian territory in the 8th century. The opposition between Islamic and Christian kingdoms led to several centuries of dispute, creating ever changing border areas where settlement and economic activities may have assumed particular forms. Central Portugal is one of those areas, and due to the lack of written sources, archaeological investigation is the best way to characterize the way people actually lived, beyond the general political and military scenario.

The archaeological surveys at Senhora do Barrocal (Sátão, Viseu, Central Portugal), revealed a small settlement with great visual control over the valley, surrounded by several granitic tors. Somewhere between the X and XI centuries, a fire caused a collapse of a domestic structure, that allowed the preservation of a massive assemblage of archaeobotanical remains, especially fruits and seeds.

Cereal grains are the most common carpological remains. There is a dominance of rye (*Secale cereale*) and oat (*Avena sativa*/strigosa), followed by hulled barley (*Hordeum vulgare*), common millet (*Panicum miliaceum*), naked wheat (*Triticum aestivum*/durum) and foxtail millet (*Setaria italica*). Other crops such as pulses, fruits and oil/fibre plants were also recovered. The predominance of undemanding crops in a small-scale site, located outside major areas of influence seems to suggest a strong rural character and a scenario of agricultural subsistence at Senhora do Barrocal.

Data concerning early medieval agriculture in the region is still scarce and mostly relies on the few written sources available, all slightly more recent than the Senhora do Barrocal occupation. Therefore, the development of archaeobotanical analyses is a crucial tool for the understanding of crop diversity as well as agricultural practices, by past communities during Early medieval times in Central Portugal.

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## THE WILD NORTHEAST. IDENTITIES IN COEXISTENCE IN THE UPPER FRONTIER OF AL-ANDALUS

**Abstract author(s):** Brufal, Jesús - Olivé-Busom, Júlia (University Autònoma of Barcelona) - Gonzalez, Àngela (Universitat de Lleida)

**Abstract format:** Oral

The archaeology of the Upper Frontier of al-Andalus is conditioned by a lack of anthropological evidence that hinders the exploration of the living conditions of the different populations that inhabited it. This relative scarcity of evidence does not, however, equate to a complete research blackhole as many efforts are being made to shine a light on our present knowledge.

The main current materials for our research are the archaeological sites of Balaguer and Santa Coloma d’Ager, both located in the province of Lleida (Catalonia, Spain). Balaguer was an urban outpost mainly centred on the defence of the frontier and the protection of its population, whilst Santa Coloma d’Ager consisted on a Christian burial space that was continuously used from the 5th century, before the Islamic conquest, until the 11th century due to the feudal conquest. In Balaguer, a series of archaeological interventions yielded a total of 44 individuals hailing from two of its currently known maqabir. Meanwhile, in the burial grounds of Santa Coloma d’Ager 130 individuals have been unearthed. Therefore, during approximately 4 centuries, two cultures with theoretically very different socioeconomic and feeding practices coexisted on the same space, which was under more or less continuous pressure due to its closeness with the Christian counties.

The analysis of the burial context of both Santa Coloma d’Ager’s necropolis and Balaguer’s maqabir clearly shows that both societies rigorously followed the Christian and Islamic rituals respectively. However, to date no attempt has been made to explore whether these burial differences could be made extensive to other aspects of the populations’ lives. Through the use of the data obtained through anthropological analyses, stable isotope analyses, and biodistance analyses we aim to ascertain if these two populations led completely separate paths or if geographical, ecological or even genetic closeness led them to similar strategies.

REMEMBERING THE DEAD IN SICILY 550-1250: IDENTITIES, MOBILITY AND FAITH

**Abstract author(s):** Carver, Martin - McCarthy, Siobhan (University of York) - Rizzo, Maria Serena (Parco Archeologico di Agrigento) - Arcifa, Lucia (University of Catania) - Spatafora, Francesca (Soprintendenza archeologica di Palermo) - Mlk, Nicole (University of Innsbruck) - Orecchioni, Paola - Molinari, Alessandra (Universit di Roma Tor Vergata)

**Abstract format:** Oral

Early Medieval Sicily was occupied in the Late Roman, early Byzantine, Islamic, Norman, and Swabian periods by, respectively, Latin Christian, Greek Christian, Sunni Muslim, Shi'ite Muslim and Latin Christian faith groups. Sixteen cemeteries in early medieval Sicily containing 213 individuals have been the subject of archaeological, bioarchaeological and biomolecular investigation as part of the sictransit project (ERC 693600).

This talk offers a brief overview of the ritual and social sequence of burials in town and country from the 6th century to the 13th, focussing on the significance and character of transitions. The study demonstrates how cemeteries marked by particular burial rites and locations begin, co-exist, overlap or fade out over time, with implications for their correlation with documented identities and mobility. The relatively long chronological framework and the biomolecular approach offer fine opportunities to examine how undocumented people in historical periods variously signal their identity, status, rank, sex, age, health, diet and origin over some 700 years.

Reference: The Archaeology of Regime Change: sicily in transition.org.

DIET IN MEDIEVAL SICILY THROUGH TIME (AND SPACE): AN ISOTOPIC APPROACH

**Abstract author(s):** Alexander, Michelle - Ughi, Alice (BioArCh, University of York)

**Abstract format:** Oral

This paper explores the potential impact of successive changes of socio-political rule on agriculture and dietary practice in Medieval Sicily between the 5th century AD and the 13th century AD. We explore diet through analysis of bulk stable carbon and nitrogen data from the bone collagen of >160 humans and >140 animals from at least 20 sites across Sicily. The isotope data is explored for potential evidence of socio-economic (and agricultural) change through time, differentiation between regions (East and West), and also between and within sites, particularly any differences arising between individuals of differing faith as identified through burial practice (Christian and Muslim). Animal data from some sites in particular indicate shifting husbandry practices for certain species such as chickens. Sulphur data will also be presented from a sub-sample of humans and animals that is suggestive of geographic differences in the dataset.

In addition to bulk stable isotope analysis, we will present some first results of compound specific stable carbon and nitrogen isotope analysis of collagen amino acids (CSIA-AA) via GC-C-IRMS. This technique, only recently being applied to archaeological populations, offers better resolution in animal and human diets, particularly in circumstances where consumption of Mediterranean fish are difficult to disentangle.

This research forms part of the collaborative EU funded project Sicily in Transition (SICTRANSIT, York, Rome, Lecce) which aims to understand the social, economic, and demographic changes that occurred through successive periods of Byzantine, Arab, Norman and Swabian rule in Sicily.

a.

CARBON AND NITROGEN STABLE ISOTOPE ANALYSIS ON STORED CROPS FROM EARLY MEDIEVAL VILLAGE OF MIRANDUOLO (SIENA, ITALY)

**Abstract author(s):** Colella, Mirianaconcetta - Cal, Paula (University of Salento, Laboratory of Archaeobotany and Paleoecology) - De Benedetto, Giuseppe - Pennetta, Antonio (University of Salento, Laboratory of Analytical and Isotopic Mass Spectrometry) - Primavera, Milena (University of Salento, Laboratory of Archaeobotany and Paleoecology) - Valenti, Marco (Department of Historical Sciences and Cultural Heritage. University of Siena) - Fiorentino, Girolamo (University of Salento, Laboratory of Archaeobotany and Paleoecology)

**Abstract format:** Poster

Miranduolo (Chiusdino, Siena) is an important medieval site located in southern Tuscany and excavated by University of Siena from 2001 to 2016. The archaeological investigation discovered a settlement founded in the 7th century as a site of exploitation of mineral resources. During the 8th century the village take a change relative a new economical system up to define a complex social hierarchy.

The different spatial distribution of the storage systems, hierarchically and socially separated, has allowed selecting the contexts under archaeobotanical and biochemical investigations. In particular the storage units studied in reference to plant macro-remains and their isotopic value are: a) the warehouse SF65 of the farmer-blacksmith, one of the relevant figures in the village, which is located on the upper terrace; b) three connected granaries, belonging to a large storage area (SF11) situated on the north terrace; c) the granary of a peasant hut (C34), located in the southern part of the village.

The archaeobotanical and biochemical results coming from these contexts are then compared in order to understand the relationship between the social transformations and the management of agricultural resources according to the new social hierarchy highlighted by archaeological evidences. The analyses of carbon and nitrogen isotopes on cereals collected into the different storage structures can help to better understand the origin of the crops, the way of collecting and redistributing the foodstuff.

MIDDLE-BYZANTINE HUMAN POPULATIONS FROM ROMANIAN DOBRUJA. AN OSTEOARCHAEOLOGICAL APPROACH

**Abstract author(s):** Vasile, Gabriel (Vasile Parvan Archaeology Institute, Bucharest)

**Abstract format:** Poster

Dobruja is a historical region in Eastern Europe situated between the lower Danube River and the Black Sea.

The Dobrujan Middle-Byzantine centres identified along the right shore of the Danube and the Black Sea coast are fortified urban ports, covering the period between the 10th and the 15th century. This period begins with the Byzantine re-conquest of the Lower Danube during the reign of Emperor Ioan Tzimiskes, with all the events that directly affect the northern border of the Byzantine Empire (the pecheneg invasion and migration, the attacks of the cumans, the invasion of the tartars) or even its existence (the Asneşti rebellion and the rise of the Vlaho-Bulgarian Empire, the Latin conquest of Constantinople, the Palaeologus restoration) and the moment of Dobruja's entry under the authority of Wallachia or under Turkish control. The fortified character, the production and commercial traits, the essential aspects of living are complemented by elements of funeral rite and ritual.

The history and evolution of human populations represents a corollary of several disciplines, among which osteoarchaeology, occupies an important place. This field brings significant contributions, which is reflected in a wide range of biological indicators that express the structural profile of the population, the way of life of the individuals, the body's fighting potential against various diseases or the genetic heritage.

For a better understanding of the funeral practices and the phenomenon of death in the Middle Byzantine period (especially for the populations of the Lower Danube area), we have analysed the skeletal material from over 350 funerary complexes from three Middle Byzantine necropolises: Noviodunum-Isaccea (Tulcea County), Nufru (Tulcea County) and Pciuil lui Soare (Constana County).

THE PRECARIAT IN ARCHAEOLOGY [ECA]

**Theme:** 7. 25 years after: The changing world and EAA's impact since the 1995 EAA Annual Meeting in Santiago

**Organisers:** Brami, Maxime (Palaeogenetics Group, Johannes Gutenberg University Mainz) - Emra, Stephanie (University of Veterinary Medicine Vienna, Anatomy) - Malag, Aldo (Monrepos, Rmisch-Germanisches Zentralmuseum) - Muller, Antoine (The Institute of Archaeology, Hebrew University of Jerusalem)

**Format:** Round table

This round table organized by the EAA Early Careers in Archaeology (ECA) task force will explore the current challenges and opportunities facing early career researchers in archaeology, here defined as the 'precariat of archaeology'.

Objectives:

- To examine the shared experiences and challenges, both positive and negative, that early career researchers in archaeology have long faced
- To assess how these experiences have impacted on archaeologists pursuing an academic career in archaeology
- To highlight how the growing trend in academia towards fixed-term, temporary and underpaid jobs is now transforming these shared experiences, impacting on early career researchers as individuals, on their economic and mental well-being, and the discipline more widely
- To outline how the EAA Early Careers task force is seeking to measure and assess the impact of these changes and to present some results of initial consultation work
- To discuss how solidarity can be created amongst the precariat and most robust support offered within the discipline at all levels of practice.

EDUCATION SHAPING PUBLIC PERCEPTIONS OF MEDIEVAL ARCHAEOLOGY

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Lewis, Carenza (University of Lincoln) - Chavarria, Alexandra (Universite di Padova) - Marciniak, Arkadiusz (Adam Mickiewicz University in Poznan) - Fernndez Fernndez, Jess (Univeriste di Oviedo) - Grkiewicz Downer, Abigail (University of Chester)

**Format:** Regular session

EAA's 2019 roundtable developing a MERC-sponsored 'manifesto' for medieval European archaeology included discussion about the impact of public perceptions, not only on archaeological practice but also on wider society. There was a consensus that a better-informed public with a more nuanced understanding of medieval history and archaeology would help better protect medieval heritage (tangible and intangible), enhance the benefits it offers, and mitigate some of the malign uses to which it can be put. It was recognised that education is fundamental to this, accordingly this session aims to explore how medieval archaeology is taught, learned or otherwise encountered in schools and the impact of this on subsequent attitudes.

This session welcomes papers that present, review, question or challenge the ways in which young people are exposed to medieval archaeology in educational settings, especially in school. We look forward to papers from the widest possible range of places, exploring themes which may include (but are not limited to):

- how medieval European archaeology is taught in (or excluded from) formal school curricula;
- commonalities and differences in the place of medieval European archaeology in school curricula across Europe (and beyond);
- the extent of opportunities beyond formally prescribed curricula for young people to learn about medieval European archaeology and how these can (or should be) incorporated into classrooms;
- attitudes of young people and/or educators to teaching and learning which encompasses medieval European archaeology;
- how teaching of medieval European archaeology has changed over time;
- the impact of external factors (new technologies/discoveries or political or educational ideological changes) on teaching and learning around medieval European archaeology;
- the impact of school-age learning about medieval European archaeology on adult attitudes or life experience;
- future priorities, for archaeologists and/or educators, in ensuring education can help medieval European archaeology help society?

ABSTRACTS

1 MAKING THE MEDIEVAL MEANINGFUL: AN EXAMPLE FROM ENGLAND

**Abstract author(s):** Henson, Donald (University of York)

**Abstract format:** Oral

The Medieval period of history is one that is often simplified as kings, knights, castles and battles. In reality, the period has a lot to offer for the understanding of fundamental historical processes. These processes are outlined in the National Curriculum and are often well taught by teachers: including continuity and change, cause and consequence, similarity, difference and significance, create structured accounts. Students are encouraged to make connections and draw contrasts, between local, regional, national and international history; and between cultural, economic, military, political, religious and social history. However, the period also offers a way of understanding the modern world, either as a continuation of existing trends or as a useful counterpoint through which we can see the present more clearly. In this talk, I shall look at what the period has to offer and how it can be made more meaningful in ways that go beyond the simplistic stereotypes that the word medieval invokes. Examples will be taken from the English curriculum and history, but these will have wider applicability and significance. Might we bringing non-medieval perspectives to bear on the period. For example, could we learn from the wider archaeological community and treat Medieval England as a colonised region whose indigenous peoples deserve a voice? These and other ideas will be raised for discussion.

2 MEDIEVAL TIMES ARE DARK TIMES IN AUSTRIA

**Abstract author(s):** Peter, Sigrid (ArchaeoPublica; Association for preservation and research on Castle Ried am Riederberg)

**Abstract format:** Oral

This talk considers the Austrian curriculum of the school-subject of “History and social studies/Political Education” on the one hand. On the other side there will be some options for educators and students to have a look at from an archaeological point of view on life in medieval times.

The current curriculum of “History” changed its focus from a linear timeline of all epochs of history to a more contemporary form of didactics. Now there is a competence framework which includes historical as well as political competences. Students will first learn these theoretically and apply them in their everyday life. Sadly, there is less time for archaeology and recent schoolbooks are putting their focus on outdated knowledge which is simply refurbished with new didactical techniques and methods.

However, some examples exist outside schools and schoolbooks, like a museum exhibition I have designed in 2017 about an old castle ruin in Lower Austria. This castle ruin castle is researched by the “Association for preserving and research of Castle Ried am Riederberg”, which is a bottom-up citizen association. It works together with professionals as well as citizens and the Austrian Monument Federation. The exhibition focused on a medieval archaeological and on learning by doing for old and young. Therefore, I will introduce some stations where people can try out how (medieval) archaeologists are working and there will be a connection to the latest curricula shown. Last but not least, I will present the public relation work for citizens, like open dig days, and the benefits of a cooperation with living historians.

3 ITALIAN SCHOOLS AND MEDIEVAL HERITAGE: THE HARMONY IS YET TO COME

**Abstract author(s):** Schivo, Sonia (University of Padua)

**Abstract format:** Oral

The didactic programmes taught in Italian schools are the result of a long legislative process started in the 19th century, and they reflect a centralized vision of national education. A turning point was during the 1990s, with the implementation of educational autonomy. This changed the educational activity in schools, as it introduced the Educational Offer Plans (EOP, Piani dell’Offerta Formativa in Italian), which to a certain extent can be independently developed by each school. These EOPs include all the projects that bring schools closer to their local environment (engaging local institutions and organizations), as well as all educational programmes

aimed at developing the key competences set by the European Union for lifelong learning.

The analysis of educational activities (grouped by European competence) in the EOPs of the schools in the city of Padua (Northern Italy) show the educational aims of each institute outside of the national programme. The results show either a low interest of schools towards the themes of heritage and archaeology, or a scarce offer of those kinds of activities.

Starting from these premises, we developed an activity related to medieval archaeology in a school in Padua. The main objective was to promote the methodology of archaeology of standing buildings as a support to traditional methods to study the history of architecture. We wanted to help the students discover their local cultural heritage, which is neglected by national educational programmes. It is essential that new generations gain knowledge of the local heritage, if we expect them to confer any “value” to it. Parallel we ran a survey to understand the impact of the activities. The application of sociological tools allowed us to determine the change in the students’ notion of archaeology by comparing initial test results with a second assessment six months after the completion of the activity.

4 BETWEEN ACADEMIA AND THE REAL WORLD: TEACHING MEDIEVAL ARCHAEOLOGY IN ITALIAN UNIVERSITIES

**Abstract author(s):** Chavarria Arnau, Alejandra (University of Padova)

**Abstract format:** Oral

The presentation will explore the content of the courses related to medieval archaeology in Italian universities, as well as most workshops and practical activities linked to these courses. It will underline that the Italian academic system, despite its long academic path (BA-MA-post graduate degrees), does not really train to the various needs of professional life and new opportunities for present and future medieval archaeologists, neither from a content nor from a practical perspective. The paper will propose different immersive learning experiences linked to a broader and more participatory concept of (medieval) archaeology. At the same time, it will underline the complexity of doing it. This is partly due to the fact that students are mostly attracted by a romantic idea of archaeology. Furthermore, Italian policies limit the opportunities for collaboration between the universities and the wider public. This jeopardises the professional success of young archaeologists in Italy and their ability to communicate archaeology to the public and therefore their perception of archaeology.

5 BEYOND THE HORIZONS OF HISTORY TEACHING

**Abstract author(s):** Dutra Leivas, Ivonne (Linneaus University)

**Abstract format:** Oral

In this paper I will present some of my results from my licentiate thesis.

The aim of my licentiate thesis was to investigate how educational programs for schools are implemented within the framework of contract archaeology in Sweden. I study the underlying incentives that motivate public outreach within contract archaeology, who carries out the outreach and what impact educational programs have on schools. My research project also aims to explore how public outreach within contract archaeology can be organized to meet schools’ demand for knowledge and activities. With an interdisciplinary approach, taken from archaeology and educational sciences, the goal is to instigate a dialogue between the scientific community and contract archaeology, as well as between contract archaeology and schools.

As a primary goal, midway into in my doctoral degree, I have chosen in this licentiate thesis to study the practices of public outreach on urban excavation sites in Sweden, specifically studying outreach practices towards schools.

The research queries in the licentiate thesis are:

- What are the purposes and objectives with public outreach in contract archaeology?
- What are the preconditions for working with public outreach in contract archaeology?
- How are the practices of public outreach aimed at schools conducted at urban excavation sites?
- How do educational programs within contract archaeology address the needs and goals of school education?

Based on these queries, I also discuss how contract archaeology in the future can make possible broader collaborations with schools. This serves as an introduction to how archaeo-didactics can evolve bringing together contract archaeology’s goals and potential in an educational situation, with the needs and goals of school education.

6 NEW ARCHAEOLOGICAL NARRATIVES IN DEEP RURAL AREAS TROUGH EDUCATIONAL PROJECTS. SOME STUDY CASES FROM ASTURIAS, SPAIN

**Abstract author(s):** Fernández Fernández, Jesús (University of Oviedo; University College London)

**Abstract format:** Oral

In the last part of the twentieth century, a series of narratives that simplify landscape history have been deployed over some northern Spain mountainous areas (Asturias). The landscape is promoted through tourism campaigns as a natural object. These post-modern narratives hide -voluntary or involuntary- the fact that the landscape is a cultural product built by the peasantry over the centuries. In this way, problematic aspects associated with that landscape and those social groups are also hidden, such as the enormous social inequalities of the past. A beautiful natural landscape populated by wildlife is unquestionably more evocative and less problematic not only for foreign tourists but also for local city residents disconnected from the problems facing rural commu-



nities. These visions have a major effect among young people, a much more worried and sensitive generation to the nature preservation messages which is increasingly unaware their own territories history. Can archeology be a helpful tool to problematize these questions? This paper shows some examples of how archeology is used to discuss and question these narratives and contribute to change the vision that young people have about cultural landscapes through different experiences in educational contexts, both formal and informal. These examples help us to illustrate the potential that archeology has not only as a science of the past but also as a critical tool in the neoliberal educational framework in which humanities are increasingly cornered.

7

CHALLENGES FROM THE CHALKBOARD: THE TEACHER’S PERSPECTIVES ON MEDIEVAL ARCHAEOLOGY

**Abstract author(s):** Costello, Brian (University of Chester)

**Abstract format:** Oral

In the discussion of the education of medieval archaeology, it is necessary to incorporate a variety of perspectives to better identify areas of concern and ways to improve public understanding of the subject. Specifically, the perspectives of schoolteachers can highlight both the positive and negative characteristics of the education of the medieval period. A better-informed public begins with the quality of education provided by public schools and properly supported teachers. However, government-issued curricula offer little detail or support for subject topics such as the European medieval past, and in many cases research and educational resources are left to individual teachers to obtain and implement. For archaeologists and the general public, it is essential to collaborate and understand the thoughts and views of teachers who are tasked to educate the public with such topics as European medieval archaeology.

By understanding the challenges and realities of the instruction of the medieval period within public schools, solutions and improvements can be implemented. Therefore, this paper reviews aspects of medieval archaeology taught within public schools by teachers from both the United Kingdom and the United States. This study interviewed a number of public school teachers in order to identify the issues that arise in the education of the medieval period, the resources and materials used, the time spent on the subject, the teachers’ knowledge of medieval archaeology, and the knowledge base of their students. The collaboration between teachers and archaeologists will open a dialogue, initiating the improvement of government curricula, teacher support, and educational resources, in order to develop a better-informed public regarding medieval archaeology.

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DIGITAL POTTERY ARCHIVES: NEW METHODS OF DATA USE AND CLASSIFICATION

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Gattiglia, Gabriele (University of Pisa) - Wright, Holly (ADS - University of York) - Anichini, Francesca (University of Pisa - MAPPA Lab)

**Format:** Regular session

Pottery recognition is a task of paramount importance for dating archaeological contexts and for their interpretation. Unfortunately, this task continues to be a very time-consuming activity. In a hyper-connected world, where the information is easily available online, pottery catalogues are still primarily found only in print format and can be difficult to obtain (especially for professionals or people without access to archaeological library resources). Furthermore, the availability of large amounts of data (e.g. images) may allow the application of new methods in archaeology, such as Machine Learning or other types of Artificial Intelligence.

Copyright, IPR, long term curation, and the need to update resources as new research is undertaken, often discourage the creation of digital pottery resources that are openly available and accessible. On the other hand, digital resources are offered to the public from volunteers or archaeology enthusiasts without any possibility of assessing the provenance of the published information. In recent years, digital catalogues have been created using different specifications, categories and thesauri. A common vision may still be missing, and meaning data can not interoperable and re-used for potential digital applications.

In this framework, the session welcomes a range of papers on digital pottery repositories regardless of geographic region or time period in order to start an open and collaborative discussion around the needs of archaeologists needs, and potential opportunities for re-use. This includes papers discussing problems related to pottery data digitisation and archiving, digital collaborative approaches to ceramic collections, copyright, accessibility, interoperability, re-use of data, validation of published information, updating of resources, and papers that aim to bridge the gap between archaeologists with and without a background in ICT.

ABSTRACTS

1

COPTICE. COPTIC CERAMICS: AN OPEN ACCESS CORPUS OF BYZANTINE EGYPTIAN POTTERY, TOWARDS A UNIVERSAL CLASSIFICATION SYSTEM

**Abstract author(s):** Incordino, Ilaria (Università degli Studi di Napoli)

**Abstract format:** Oral

The COPTICE project aims at building an open access database of Byzantine pottery from Egypt, kept in the museum collections of ancient Coptic art of the world, and deriving in particular from the Italian-Egyptian Archaeological Project at Manqabad (Asyut), led

by the Egyptological team of the University of Naples “L’Orientale” since 2012. The Principal Investigator, currently in charge of the study and analysis of the Manqabad pottery, will, with the help of her team, document and digitalize the ceramic material stored in the most relevant Coptic collections of the world (Cairo, London, Oxford, Cambridge, Liverpool, Bruxelles, Athens, Leningrad, Turin, Florence, Berlin, Frankfurt, Paris, Orleans, Marseilles, Toronto), trying to define a uniform and generally accepted classification system. In fact, even if in the last decades many attempts have been successfully made to tackle this issue, the Byzantine ceramic typologies from Egypt still lack a comprehensive treatment. The ambitious objective of the COPTICE research team will be the creation of an innovative, web based, GIS referenced model, which could be continuously updated with excavation or warehouse material. The impact of this work could be traced in the chance to identify unknown provenience of ceramic items stored in museums, as well as the assessment of a more precise chronological frame for the Coptic pottery in general. The COPTICE project will adopt a multidisciplinary approach to the study of provenance and production technologies related to Late Antique pottery in Egypt, through the application of archaeometric analysis, in order to determine compositional and mineralogical features. The COPTICE team will examine in depth the influence of Western pottery traditions related to Late Roman production within the multicultural Egypt of the first centuries AD, in which the emergence of the Christian cult determines new trends of cultural expression.

2

THE AFTERLIFE OF ERRORS. DEALING WITH DIGITIZED POTTERY CATALOGUES

**Abstract author(s):** Rembart, Laura (Austrian Archaeological Institute of the Austrian Academy of Sciences) - High-Steskal, Nicole (Department for Image Science, Danube University Krems)

**Abstract format:** Oral

From 2016 to 2019, the authors were involved in the Open Access publication of two large pottery assemblages that had been discovered during excavations of the Austrian Archaeological Institute in Syene and Elephantine/Upper Egypt.

The large quantity of diagnostic pottery fragments (16.000 diagnostic fragments) were documented in two legacy databases and files in six different file formats written in two languages and of both born-digital as well as digitized content. In order to cope with the size of the dataset and number of different file types, we developed a workflow to process the data in a consistent format. The goal was to prepare the data in such a way that the dataset would be findable, accessible, interoperable and reusable by others and in formats that would ensure their long-term preservation.

Despite meticulous documentation processes, our work was regularly interrupted by the discovery of small errors which were easier to identify in structured datasets than in their pre-digital format. Following the detection of several similar errors, we decided to analyze how, what, and when these errors had occurred. This led us to critically reassess the documentation cycle as well as decide on strategies for dealing with errors in a transparent manner. Overall, we estimate that 10-20% of all pottery records have errors of varying degrees of severity leading us to believe that further work on the digitization of pottery data might lead to a reevaluation in some parts of the field.

The digitalization process forced us to question the basis of our knowledge, underlying assumptions and our work processes. It also led to many critical discussions within our project, which greatly contributed to a refinement and improvement of the data quality of our dataset as well as communication among team members.

3

CREATING AN OPEN-ACCESS DIGITAL REPOSITORY OF ARCHAEOLOGICAL AND EXPERIMENTAL CERAMICS: THE TRACING THE POTTER’S WHEEL APPROACH

**Abstract author(s):** Hilditch, Jill - Jeffra, Caroline - Opgenhaffen, Loes (Universiteit van Amsterdam)

**Abstract format:** Oral

As a multiyear project funded by the Dutch Research Council (NWO), the Tracing the Potter’s Wheel (TPW) project has a commitment to creating open-access publications and resources. A major output of the project is an archive which captures technologically-focused information about both archaeological and experimental ceramics. The structure of the archive includes multiple file types for images, video, and 3D models as well as contextual information, metadata and paradata. These two types of ceramic datasets therefore pose different challenges for the process of digital archiving as well as maintaining open access – such challenges include accommodating international heritage directives, adhering to publication permissions, appropriately funding the long-term storage of data, and anticipating which solutions are least likely to fall into obsolescence.

This paper discusses the practical hurdles which have been faced and surmounted over the course of the TPW project. The presentation covers aspects of archiving which are specific to the problems overcome. We highlight in particular the need to move beyond a traditional ceramic catalogue to create a digital archive which provides learning pathways for users to gain more out of the dataset. The TPW archive is a dynamic learning tool which marries the stable storage of digital pottery information with a user-focused interface. Through this user-focused interface, the archive is a valuable research tool for both specialists and novices alike.

4

PROCESSING LARGE CERAMIC ASSEMBLAGES USING LASER PROFILING AND AUTOMATED SHAPE MATCHING

**Abstract author(s):** Demján, Peter (Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague)

**Abstract format:** Oral

Capturing, cataloging and analyzing shapes of ceramic vessels is amongst the most informative, and also most laborious parts of

the archaeological process. Advances in digital image processing and machine learning allow us to introduce an increasing degree of automation into pottery processing, simplifying the task of finding similarities and dissimilarities between individual vessels within assemblages counting often tens of thousands of fragments. To achieve good results, we need firstly digitization methods which allow us to capture the shapes of ideally all diagnostic fragments in a relatively short time frame. Secondly, we need methods which translate part of the expertise of a trained ceramicist into computer algorithms and pre-sort these large data sets into manageable typological groups.

The Laser Aided Profiler (www.laseraidedprofiler.com), presented in this paper, allows for high-quality drawing documentation of dozens of ceramic fragments per day. It is a portable system, applicable e.g. at excavations abroad where long-term storage or transport of the finds to the home institution is not possible. Within a few minutes, it is possible to make a digital vector drawing that can be used to create a classic catalog and further use the acquired profile for morphometric analysis.

We also present a new methodology of calculating morphometric (dis)similarity based on rim fragments, which was so far applied on 1200+ specimens of Bronze Age pottery. The resulting dissimilarity matrix served as input for Hierarchical Cluster Analysis, which was then employed in the typological classification of the material.

5 **COMPARING SANTANA DE MUREȘ – ČERNJACHOV SITES, BASED ON CERAMIC FINDS SPECTRA**

**Abstract author(s):** Mom, Vincent (DPP Foundation Rotterdam) - Lăzărescu, Vlad-Andrei (Romanian Academy. Institute of Archaeology and History of Art, Cluj-Napoca)

**Abstract format:** Oral

In 2014 a project was started to create a digital archive of Santana de Mureș – Černjachov (SMČ) pottery, based on available printed material. The SMČ culture resulted from a north-south migration that probably originated in the region south of the Baltic Sea during the 2nd century AD. Its spread has, in time, formed a large area, ranging from nowadays Poland to the distant parts of eastern Ukraine and Romania. The end of this era coincides with the massive Hunnic migration during the late 4th century.

The essential data that are stored, per vessel, are the image, as published, and its profile. If the vessel’s height is also available then this is added to the data base. It can be used to make an estimate of the vessels content and weight.

The initial project focus was on a number of large necropolises in Romania (Mihălășeni (1034 vessels), Barlad – Valea Seacă (635) and Târgșorul Vechi (258)). These 3 burial grounds cover the whole SMČ period. Currently the catalogue contains over 2500 vessels, mainly from Romania but also from Moldavia.

The catalogue enables the user to compare the shape of individual ceramic vessels, and to search for ‘lookalikes’. A new research feature was recently added: the possibility to compare the dissimilarity of complete sites, based on their ceramic finds spectra: essentially, all vessels from two sites are compared with each other, resulting in a distance matrix, in which the distance values indicate the dissimilarity of two vessels. This distance matrix, in turn, is then the basis for a calculation of the dissimilarity of the two sites.

6 **AI: ABOMINABLE INTELLIGENCE OR THE FUTURE OF ARCHAEOLOGICAL INVESTIGATION?**

**Abstract author(s):** van Helden, Daniël - Núñez Jareño, Santos - Allison, Penelope - Tyukin, Ivan (University of Leicester)

**Abstract format:** Oral

To say that pottery remains from the Roman period are rich is to seriously understate the case. In many ways, their very abundance is a hindrance to their full exploitation. With current practices, comprehensive study of even moderately sized pottery assemblages is prohibitively expensive. Yet these assemblages potentially hold important information about their use in life that would be very useful for our understanding of the past.

To make analysis of such large assemblages feasible, we need to reduce the specialist time required to record them. The Arch-I-Scan project aims to contribute to this goal by employing machine learning AI software to automatically identify and record Roman pottery remains. Using photographs taken with handheld devices, such as smartphones, we aim to train the AI system to learn to recognise the different typological categories and record them. This could potential save time and funds, not least because recording on these devices can be carried out by non-specialists, freeing up specialist time for more interesting analyses.

This paper outline the design process, data gathering as well as the important concomitant research-ethical questions that come with research and archaeological work using AI technology.

7 **FROM ARCHAIDE PROJECT TO AN INTEGRATED DIGITAL POTTERY ARCHIVE**

**Abstract author(s):** Anichini, Francesca (University of Pisa) - Wright, Holly (University of York) - Gattiglia, Gabriele (University of Pisa)

**Abstract format:** Oral

Today, characterisation and classification of ceramics are carried out manually, through the expertise of specialists and the use of analogue catalogues. While not seeking to replace the knowledge and expertise of specialists, the ArchAIDE project (www.archaide.eu) worked to optimise the identification process, developing a new system that streamlines the practice of pottery recognition in archaeology, using AI, with an innovative app for mobile devices and desktops, where a single photo is enough for recognition. The

project created a pipeline where potsherds are photographed, their characteristics compared against a trained neural network, and the results returned with suggested matches from a comparative collection with typical pottery types and characteristics. Once the correct type is identified, all relevant information for that type is linked to the new sherd and stored within a database that can be shared online. Once the correct type is identified, all relevant information for that type is linked to the new sherd and stored within a database that can be shared online. This goal has been implemented through the creation of:

- a digital comparative collection for multiple pottery types,
- incorporating existing digital collections, digitised paper catalogues and various photography campaigns;
- an automated-as-possible workflow to accurately digitise paper catalogues and improve the search and retrieval process;
- a multilingual thesaurus of descriptive pottery terms;
- two distinct neural networks for appearance-based and shape-based recognition;
- an app;
- a desktop application.

The ArchAIDE integrated system can be expanded to include other ceramic classes, including new reference catalogues in the ArchAIDE database and a new dataset for training the neural networks to recognise new potsherds.

8 **THREE CASE STUDIES TO TEST THE DIGITIZATION PROCESS OF POTTERY AND THE IMPORTANCE OF THE COLLABORATIVE APPROACH**

**Abstract author(s):** Taloni, Maria - Venditti, Caterina (Ministry for Cultural Heritage, Activities and Tourism)

**Abstract format:** Oral

The digital revolution of public administration and in the field of cultural heritage encourages the Directorate-General to collaborate and coordinate research activities, undersigning agreements and testing collaborative networks. In similar background we are aiming to set up a complex program of digitalization of groups of materials different for belonging geographical areas, chronology and stadium of analysis, useful to stress the potentiality of ArchAIDE algorithm at every stage. The digital acquisition will be tested in the project of restoration and valorisation of Silvestri-Rivaldi palace in Rome. We will focus on a lot of heterogeneous pottery dated between the first imperial age and the VII c. A.D. A selected group will be digitalized and uploaded in the ArchAIDE database and classes already implemented will be submitted to the recognition algorithm.

The knowledge base implementation for the digital recognition will be developed in two sub-projects. The former will be realised in the frame of an agreement with the Civilisation museum. The pottery belongs to the Riserva del Truglio necropolis (Latium Vetus), dates to I Iron Age and Orientalising period and includes several classes, divided in different forms and types, drawn and classified, but not yet digitalised. The latter will be carried out in the framework of an agreement with the University of Cassino and Southern Lazio and the DAI of Rome and will concern materials coming from Fabrateria Nova (Southern Latium), acquired in digital format stored in a relational database. One of the represented classes, not yet introduced in the ArchAIDE system, will be selected, in order to implement the image recognition algorithm.

The projects will allow the ArchAIDE method to be tested and increased, highlighting any potential critical issues thanks to the availability of complementary human resources, tools and data, and the possible involvement of trainees in teaching and applied research.

a. **DEVELOPMENT OF A SIMPLIFIED DATABASE OF ANCIENT POTTERY FRAGMENTS**

**Abstract author(s):** Makino, Kumi (Kamakura Women’s University)

**Abstract format:** Poster

This study focuses on the elaboration of an open database for pottery sherds found from some archaeological sites in Palestine. The author devised the basic concept of developing this database during the study of the Hellenistic pottery sherds discovered at the ancient site of Ein Gev in Israel and revised it recently (Makino 2018).

Known as POTSH1, this is a relational database holding images of the pottery fragments as well as verbal information. A user can compare the sherds without having to go through the cumbersome excavation reports from the various digs. Side-by-side images of pottery fragments along with the relevant data from several sites could lead to new insights towards the interpretation of the fragments.

The construction of the unified database, however, seems to be difficult to materialise, as scholars seem to depend only on their own database, not of others. One of the reasons is that a database usually tends to include as much information as possible, which gives others the impression that it is too complicated. The second reason is that a database tends to include many abbreviations, sometimes unique ones, created by each organizer for their own database. Archaeologists can guess some of them, but not all. Thus, a database should be simpler and easier to use for the public. It can include as much information as possible, but it needs to be simplified with a focus on more specific areas to make it easy for the public to use. For example, a database for items only related to pottery or architecture with reduced use of abbreviations would be more user-friendly.

I hope that further studies will extend the use of the unified database on a broader range of research.

b. **DATA MODELLING FOR DIGITAL POTTERY REPOSITORIES: RESEARCH EXPERIENCE OF FAIR DATA INTEGRATION AT THE POTTERY MUSEUM OF QUART (GIRONA, SPAIN)**

**Abstract author(s):** Travé Allepuz, Esther (Universitat de Barcelona) - Vicens Tarré, Joan (Museu de la Terrissa de Quart)

**Abstract format:** Poster

Quart (Girona, Spain) is the last town in Catalonia still producing greyware pottery after a long-lasting tradition known at least since the 14th Century AD. The production at this site is an outstanding reference for the study of late-medieval and modern common wares as attested by archaeological and archival evidence.

As part of a collaborative project between the University of Barcelona and the Pottery Museum of Quart, a digital catalogue of the Museum’s funds is currently under construction. With the aim of creating a FAIR pottery repository for research, teaching and dissemination purposes, we carried out an ontology-mediated data modelling [1] built upon the principles of Archival Science, Constructed Past Theory [2] and integrated historical research [3].

Considering the crucial need for reference collections for post-medieval archaeological pottery analyses, the repository includes contextual, descriptive, graphic, petrographic, and morphometric data [4] useful for both high-level research and general dissemination. It also includes ethnographic and bibliographic reference information about pottery-making practices and vessel styles.

This poster aims at introducing the architectural structure of the database and its underpinning data modelling in order to discuss its potential as a multi-purpose resource, and gathering some feedback for application enhancement.

[1] González-Pérez, C. 2012. A Conceptual Modelling Language for the Humanities and Social Sciences. Sixth International Conference on Research Challenges in Information Science (RCIS).

[2] Thibodeau, K. 2019. The Construction of the Past: Towards a Theory for Knowing the Past. Information, 10, 332.

[3] Mauri, A. et al. 2012. An Integrated Implementation of Written and Material Sources – Conceptual Challenge and Technological Resources. Archaeology. New Approaches in Theory and Techniques, InTech: Croatia, 41-64.

[4] Travé, E. et al. 2019. Morfometría de cerámicas grises catalanas: Algunas consideraciones sobre la definición de tipos en cerámica común de época medieval y postmedieval, Zephyrus, 84: 161-182.

c. **THE ARCHAIC MAJOLICA OF PISA: A NEW CLASSIFICATION SYSTEM**

**Abstract author(s):** Giorgio, Marcella (Independent Archaeologist)

**Abstract format:** Poster

Part of the data entry work for the implementation of the Archaide digital database concerned Pisan archaic majolica: a first phase therefore concerned the decorations and types in order to create a database and then to continue with the pottery recognition through the photographs.

If for the decorations the system used takes up what was published by Graziella Berti in 1997 on the monograph dedicated to the archaic majolica of Pisa, as regards the shape types, after a confrontation with the project managers, I chose to use a different classification.

This classification, also used in my 2009 PHD thesis at the University of Turin, does not use the mathematical data used by Graziella Berti, but simplifies and groups the typologies by common characteristics. This system, which attempts to unify the data in the 1997 catalog with other editions in previous and subsequent catalogs, was designed for a more simplified approach that would allow a larger number of users, even those who are not too specialized, to approach recognition of the class. In the same way, this system should be useful for the Archaide IT system to more easily recognize the typologies differences and associate them with the main types, without having to go into too much detail that is left to the specialists of the sector.

415	<b>FROM ABACUS TO CALCULUS. COMPUTATIONAL APPROACHES TO ROMAN ECONOMY</b>
	<b>Theme:</b> 5. Theories and methods in archaeology: interactions between disciplines
	<b>Organisers:</b> Romanowska, Iza (Barcelona Supercomputing Center) - Verhagen, Philip (Vrije Universiteit Amsterdam)
	<b>Format:</b> Session with keynote presentation and discussion
	The study of the Ancient economy is an interdisciplinary endeavour on the intersection of archaeology, classics and historical economy, that tries to reconcile evidence from written and material sources across a wide range of regions, with different degrees of data availability and diverse traditions of studying these sources. The ‘Roman economy’ is a concept that has many possible interpretations, and accommodates a wide range of case studies from estimating production capacities and local trade networks to Empire-wide investigations on demography, wealth distribution and trade volumes.
	With the advent of ever-growing and better accessible digital datasets, increasing computer power and more sophisticated computer science approaches to data mining and modelling, the analysis of the Roman economy is now entering a new stage. We can now start to meaningfully connect disparate data sets and use formal computational modelling to explore their potential, e.g., to elucidate the mechanisms that led to the different economic trajectories in the various parts of the Empire, or to reconstruct the social and political networks that enabled economic growth.
	In this session, we invite speakers to present studies of the Roman economy that have used computational modelling as a tool to

- bridge the gap between fragmented, disconnected data sets and interpretive frameworks. This can include but is not limited to:
- statistical modelling,
  - data mining,
  - agent-based modelling and simulation,
  - network analysis,
  - spatial modelling
  - machine learning,
  - or a combination of approaches.

These can be applied to any topic relevant to Roman Economy: demography, land use, trade networks, craft production, finance, administration and others. We are also welcoming more theoretically oriented papers on the role of computational modelling in historical economic studies of the Roman Empire and comparative case studies from other periods.

ABSTRACTS

1 **BIG DATA, SYNTHESIS, AND ECONOMIC GROWTH: AN EXAMPLE FROM ROMAN BRITAIN**

**Abstract author(s):** Ortman, Scott (University of Colorado)

**Abstract format:** Oral

There is a growing movement in archaeology to utilize the information we control to contribute in more direct ways to issues affecting contemporary society. If we really want to do this, I suggest there are three strategies we should focus on. First, we should focus on aspects of human social behavior for which a uniformitarian assumption is reasonable. Second, we should focus on processes that leverage the inherent quality of the archaeological record. And third, we should think about past societies as model systems that allow us to see fundamental dynamics more clearly. I illustrate this approach here, utilizing the remarkable databases compiled for the Rural Settlement of Roman Britain Project and the Portable Antiquities Scheme to examine the role of agglomeration effects for economic growth. I show that settlement scaling theory clarifies this relationship, and that archaeological data from Roman Britain are consistent with these ideas. Specifically, I examine coin loss rates (after conversion to a silver standard) and pottery accumulation rates across thousands of settlements to show that Roman Britain experienced both extensive (agglomeration-driven) and intensive (technology-driven) growth over a centuries-long period.

2 **RURAL LANDSCAPE THROUGH FIGURES: QUANTITATIVE ANALYSIS OF ENVIRONMENTAL AND SOCIAL GEOGRAPHY IN THE UPPER RHINE VALLEY**

**Abstract author(s):** Weaverdyck, Eli (Seminar für Alte Geschichte, Albert-Ludwigs-Universität Freiburg) - Kempf, Michael (Institut für Archäologische Wissenschaften, Albert-Ludwigs-Universität Freiburg)

**Abstract format:** Oral

GIS-based, quantitative analysis has shown great promise in further elucidating the dynamics of local economies in the Roman world. This progress has been made possible by the collation of large digital archaeological datasets, as well as the increasing availability of contemporary environmental data generated partly by remote sensing techniques. However, major challenges remain in accessing palaeoenvironments and accounting for the bias inherent in extensive archaeological data. This paper addresses these challenges through an interdisciplinary analysis of multiple datasets in order to understand rural economies in the French part of the upper Rhine valley from the pre-Roman, Roman, and early medieval periods. By combining coring and remotely sensed data, we have produced a model of the paleoenvironment, and we identify the primary biasing factors by comparing the distribution of archaeological finds to landcover changes over the past 150 years. Building on these results, we statistically analyze the prevalence of environmental features in the surroundings of rural settlements to better understand agricultural strategies. Multivariate analysis integrating local environmental factors with the larger settlement geography reveals trends in small-scale marketing relationships in the Roman period.

3 **CLIMATE, AGRICULTURE AND AGRICULTURAL PRODUCTIVITY IN SOUTHERN ROMAN GAUL: THE CONTRIBUTION OF MULTI-AGENT SYSTEM AND AGROSYSTEMIC MODELLING**

**Abstract author(s):** Bernigaud, Nicolas (CEREGE; Aix-Marseille University) - Bertoncello, Frédérique (CEPAM) - Bondeau, Alberte (IMBE) - Guiot, Joël (CEREGE) - Ouriachi, Marie-Jeanne (Nice-Sophia-Antipolis University; CEPAM)

**Abstract format:** Oral

Considered as archaic and technically limited, Roman agriculture has long been studied by historians through Latin agronomic documents alone. This thought on the nature and performance of this agriculture has benefited in recent decades by the contribution of numerous archaeological, and bioarchaeological data that make study more complex. Modelling now offers the possibility of taking these multidisciplinary data into account and testing multiple hypotheses. We present the design and the results of an agent based model (ABM) simulating the crops and agricultural surpluses of villas and Gallo-Roman farms for different crop types (wheat, legumes, vine, olives), depending on agricultural systems (technical, tools, yields,...) and climate (temperature, precipitation,...). The impact of Roman Climate Optimum on agricultural yields is measured through the Lund-Potsdam-Jena-managed-Land



(LPJmL) agrosystem model, whose principles and functioning are integrated into the ABM. The simulations allow to estimate the different variables taken into account and to assess the performance and productivity of agriculture in the south of France (Provence, Languedoc) during the Iron Age and the Roman period. The results of these simulations highlight an efficient ancient agriculture that is largely capable of generating surpluses in agricultural production.

4 **ECONOMETRICS, ARCHAEOLOGICAL ‘BIG DATA’ AND THE ROMAN ECONOMY**

**Abstract author(s):** Jongman, Willem (University of Groningen, Department of History) - Wouda, Niels (University of Groningen, Faculty of Economics and Business)

**Abstract format:** Oral

How well did the Roman economy provide for the Empire’s inhabitants? After the traditional Finleyan concern with the social status of trade and manufacturing more recent research has aligned itself more to the interest of modern economic historians with economic performance and economic change. This has involved a more explicit use of modern economic theory and, perhaps most strikingly, the use of recently constructed large aggregate archaeological datasets to overcome the limitations of anecdotal evidence from written sources. In this paper we will use new and abundant data from the Roman Hinterland Project (RHP) that integrates three existing sets of highly respected archaeological field surveys, often down to the level of individual finds (<http://comparativesurveyarchaeology.org/>). We will use these panel data for statistical and computational analyses of chronological trends and geographical patterns for three central variables on economic performance: population, market integration, and material standard of living and consumption. For our population estimates, we use densities derived from surveyed landscapes and prior work, and apply the Monte Carlo method to quantify the underlying uncertainties. For market integration and standards of living, our workhorse is the wide class of spatio-temporal panel regression models. We use network analysis to obtain the necessary (time-varying) distance weights. We contrast these results with earlier, local studies in the areas around Rome to prove the value of data integration for writing big histories from empirical data.

5 **DID EARLY ROMAN IMPERIALISM “INTEGRATE” LOCAL ECONOMIES? PROBABILISTIC ESTIMATION OF ARTIFACT USE FOR TIME SERIES ANALYSIS**

**Abstract author(s):** Collins-Elliott, Stephen (University of Tennessee, Knoxville)

**Abstract format:** Oral

The topic of market integration in the Mediterranean economy has long been linked with the rise of the Roman empire. Nevertheless, it is difficult to maintain that early Roman imperialism, from the late fourth century BCE onward, was a coherent or unifying process for local economies. Long-distance exchanges and connectivity predate Roman imperialism, and agents of the Roman state by and large did not create “free trade” zones. Furthermore, significant questions remain about the effects of warfare, plunder, indemnities, and colonization on a large scale. Yet, the view that the Roman state represents an integrative force in Mediterranean economic operations persists.

This paper provides a new means to assess integration directly from artifact assemblages, using familiar evidentiary mainstays of coinage, amphorae, and tableware. By recasting frequencies of artifacts as time series observations, their change over time can be used to assess higher or lower degrees of integration in economic habits of exchange, transportation, and storage. Resampling is used in order to address uncertainty in the data, and standard econometric methods, like co-integration, can then be applied to these estimates. Finally, an information criterion (Akaike or Schwarz) is discussed as a viable means for assessing the strength of evidence for or against integration. By synthesizing results from archaeological projects in the Tyrrhenian basin (Italy, Corsica, Sardinia, Sicily, and North Africa) over the last four centuries BCE, I aim to show that integrating moments are visible, but that they are highly localized to particular phenomena, and should not be considered necessarily the result of conquest.

6 **SPATIO-TEMPORAL MODELLING OF ECONOMIC RELATIONSHIPS ON THE DUTCH ROMAN FRONTIER: TACKLING THE UNCERTAINTIES**

**Abstract author(s):** Verhagen, Philip (Vrije Universiteit Amsterdam)

**Abstract format:** Oral

Studies of past economic patterns and relationships in archaeology are typically complicated by uneven data collection practices and a lack of standardized archiving. Settlement data, that are often used as a major source of evidence for investigating ancient economies, consequently often lack precise information on the chronology and extent of specific economic activities. In previous studies, a number of methods were developed to address chronological uncertainties, in particular aoristic modelling and statistical simulation. In this paper, I will take one step further, and use these techniques for the analysis of uncertainties in specific socio-economic indicators, in particular ceramics assemblages.

For this, I will focus on the Dutch Roman frontier, where a wealth of datasets and detailed research is available. Current hypotheses on socio-economic development during the Roman period assume a dual system of local rural production and trade on the one hand, and on the other hand an ‘urban’ system driven by the needs of the military administration that was depending on long-distance trade. The integration of these systems is assumed to have been relatively weak and short-lived. So far, however, most studies have focused on either the agrarian economy in rural settlements, or the internal economic structure of the urban and military settlements, and not so much on their interaction.

The paper will analyse how we can develop proxies from large settlement data sets that can measure economic integration, and thus can be used to test this hypothesis. In particular I will analyse the uncertainties in the spatio-temporal distribution of key artefact categories that can be used to identify economic relationships, e.g. the proportions of Samian wares vs. local wares as indicators of long-distance trade. This can be used to better understand and model the development of economic relationships in the region.

7 **A STUDY OF THE CENTURIES-LONG RELIANCE ON LOCAL CERAMICS IN JERASH THROUGH FULL QUANTIFICATION AND SIMULATION**

**Abstract author(s):** Romanowska, Iza (Barcelona Supercomputing Center) - Brughmans, Tom - Raja, Rubina (Aarhus University) - Lichtenberger, Achim (University of Münster) - Carrignon, Simon (University of Tennessee) - Bes, Philip (Independent Researcher) - Egelund, Line (University of Aarhus)

**Abstract format:** Oral

Tracing centuries of economic activity is one of the main challenges for Roman Archaeology. It requires robust datasets, theories and methods to connect tangential lines of evidence. Here we present a research pipeline through three phases: data collection, data analysis and theory testing that showcases how quantitative approaches can unlock the potential of the ceramic record for economic reconstructions.

We provide a case study centred on Jerash, a medium-sized Roman city in present-day Jordan. The full quantification of ceramics from the northwest quarter in Jerash revealed a striking and robust pattern: close to 1 million sherds across diverse contexts show the dominance (over 99%) of locally produced ceramics. The comparison with other sites in the region indicates that the ceramic data pattern of Jerash is exceptional and that theories focused on its geographical location and suitability for ceramic production alone do not suffice for explaining the centuries-long extreme reliance on locally produced ceramics.

To explore alternative hypotheses, we developed an agent-based model of economic preference designed to investigate how simple customer preferences can shape centuries long term economic and cultural trends. By applying several standard cultural evolution algorithms (conformity bias, prestige bias, neutral), we investigate how cultural, behavioural scenarios can lead to different patterns in economic data. Does a complete dominance of one type of good signify a strong preference of the buyers, or can this pattern arise from other types of cultural bias? Can a high level of variability in terms of products be equated with more complex behavioural patterns?

This study provides a benchmark for a more informed interpretation of cultural assemblages, such as pottery found at archaeological sites, and to understand what kind of processes might have driven the trends in economic activity over centuries.

8 **PROJECT MERCURY: RESOURCES FOR COMPUTATIONAL MODELLING IN ROMAN STUDIES**

**Abstract author(s):** Brughmans, Tom (Centre for Urban Network Evolutions - UrbNet, Aarhus University)

**Abstract format:** Oral

Computational modelling in Roman studies has been applied to study phenomena as diverse as the structure of Roman social networks, the supply of troops on the Limes, flows on the Roman transport system, and the agricultural productivity of regions. Despite a recent slight increase in the number of such studies, this approach is still very much the domain of specialists familiar with formal approaches that are not commonly taught or applied in Roman studies education and research: agent-based modelling, mathematical modelling, statistical hypothesis testing, GIS. There is of course no need for all romanists to become well versed in these approaches. However, in order for these new formal studies to be thoroughly and constructively scrutinised, a wider familiarity with formal methods is crucial.

Project MERCURY aims to address this need, by developing learning resources supported by Roman archaeology case studies that convincingly demonstrate how computational modelling can usefully contribute to ongoing debates in Roman studies. It focuses on supporting the ability of scholars to evaluate computational work independently and regardless of their previous experience with formal methods.

What is the aim of computational modelling? How should its results be interpreted? How can we elaborate on existing models? How can we propose alternative models in case of disagreement? All these questions are key to a constructive evaluation of computational modelling work in Roman studies, but require some familiarity with the basic principles of the method. This familiarity will be offered through the learning resources developed in project MERCURY: explorable interactive introductions to basic concepts, guidelines to best practice in computational modelling, practical tutorials for getting hands-on experience with some of the methods, and a model library of key concepts and processes that can be used to create your own models.

421 SKIN, LEATHER, AND HIDE: SCIENTIFIC METHODS AND NOVEL APPROACHES TO THE STUDY OF ARCHAEOLOGICAL LEATHER

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Busova, Varvara (Institute for the History of Material Culture RAS) - Brown, Samantha (Max Planck Institute for the Science of Human History)

**Format:** Regular session

Undoubtedly, archaeological leather as a material for research has high informational potential. It can provide insights into the ways in which ancient communities lived and, how their traditions developed in connection with their physicality, community and the surrounding environment. Resulting changes in social development, hunting practices, animal husbandry, belief systems and fashion were reflected in the types of animal skins used, skin processing and leathercraft. Archaeological skin products are rare finds and their preservation usually depends on very particular and often unpredictable factors. Moreover, the methods for scientific research of archaeological skin are dependent on the archaeological context in which these objects were found. To study leather we have access to an array of techniques including proteomic analysis, optical light microscopy, spectral imaging technologies, X-ray techniques, DNA analysis etc. Therefore, every time a new project begins one is faced with the choice of the most appropriate method to provide the most useful data, at a reasonable cost, and within an achievable time-frame. Which research methods are most applicable in a given situation, what data can we expect to receive and how can we build effective analytics based on the data obtained by traditional and/or scientific methods? We invite all leather researchers to participate in an active and productive discussion in this relatively understudied research area.

ABSTRACTS

1 OPTICAL MICROSCOPY IN ANALYSES OF LATE-MEDIEVAL LEATHER ARTEFACTS.

**Abstract author(s):** Blusiewicz, Karolina (University of Warsaw)

**Abstract format:** Oral

In the course of archaeological investigation of late-medieval urban sites, leather artefacts are often mass findings. Tens of thousands of fragments of damaged leather goods and production waste are acquired. In the process of analysis of archaeological assemblages use of optical microscopy significantly extends the amount of information obtained. Microscopic observation enables identification of the species and topographic origin of the skin, evaluation of the quality of tanning process or determining the specialization of leather workshops, based on mass material and using statistical methods. It is essential for understanding issues related to the usage of raw material and technology of medieval leather craft. In this report the results of microscopic analyses of late medieval collections of leather goods and offcuts from small towns in Gdańsk Pomerania (Poland) are presented, as well as possibilities of their interpretation. Microscopic observation is not a very innovative method, but its use in analyses of archaeological leather, especially production waste, is still not widespread despite the significant benefits for the knowledge of former leather craft.

2 REVERSE ENGINEERING ANCIENT EGYPTIAN SKIN-PROCESSING METHODS - FROM THE ARTEFACT TO THE ANIMAL SOURCE MATERIAL

**Abstract author(s):** Skinner, Lucy-Anne (University of Northampton; The British Museum) - Lama, Annie (University of Northampton) - Stacey, Rebecca (The British Museum)

**Abstract format:** Oral

Arid environmental conditions have prevailed in Egypt since the pharaonic era, augmenting the survival of ancient skin-based material in the Nile Valley. This has provided a relatively large number of well-preserved leather objects available for study (if compared to archaeological sites located in more temperate environmental zones). Also, the good physical condition of ancient Egyptian leather means that many artefacts have remained untouched by conservators and uncontaminated by addition of modern polymers, which sometimes complicate or prevent scientific study.

Preservation of entire leather objects from ancient Egypt means that it is often quite obvious what the original purpose of the artefact was (i.e. footwear, container, garment), freeing the researcher up to explore other angles of enquiry, such as what exactly was the artefact made from and what were the manufacturing methods.

The material choices and technological methods used by the makers, i.e. which animal breed, the kinds of skin-processing method used (flaying, curing, dehairing) and the preparation type (fat/oil, mineral or vegetable tanning) used, were also influenced by the arid environment, as well as multiple other factors such as the physical and political landscape and social preferences of the users and buyers of the leather products. For these reasons, it is equally as important to research the skin-processing technology as the typology of the artefacts.

Within the scope of this project, skin-processing practices have been investigated using a multi-faceted scientific and object-based (as opposed to an archaeological or library-based) approach. This paper will describe the methodologies employed - including proteomics, mass spectrometry, multi-spectral imaging, microscopy, experimental tanning and leather colouring - and offer a summary

of the conclusions made relating to the materials and manufacturing technologies.

3 LEATHER SHOES IN EARLY DANISH CITIES: CHOICES OF ANIMAL RESOURCES AND SPECIALISATION OF CRAFTS IN VIKING AND MEDIEVAL DENMARK

**Abstract author(s):** Brandt, Luise (GLOBE Institute) - Haase, Kirstine - Ebsen, Jannie (Odense Bys Museer)

**Abstract format:** Oral

This paper presents the findings of the minimally destructive biomolecular species identification method known as ZooMS (zoarchaeology by mass spectrometry) to identify the use and choices of resources for manufacturing leather shoes in urban contexts in Viking and medieval Denmark. Whereas parchment and historical skin samples have been previously analysed by ZooMS, the potential of the method is demonstrated here for archaeological, vegetable-tanned and waterlogged leather from the eleventh to thirteenth-century Danish cities of Ribe, Odense, and Viborg. Sheep, goat, and cattle were used to produce shoes, with explicit choices of species for specific purposes. The selection seems to be largely based on the skins' material properties, suggesting that functionality was more important than signalling. The urban environment is seen as promoting synergy among providers of resources, crafts, and customers.

The results of our study demonstrate the potential of ZooMS on a sample of Danish medieval leather, but can be expected to prehistoric leather finds and hold excellent potential for exploring past animal resource exploitation and preferences of skin for a variety of purposes.

4 ARCHAEOLOGICAL LEATHER DEGRADATION: AN EXPERIMENTAL APPROACH USING ATR-FTIR, MICRODSC, SOLID STATE AND UNILATERAL NMR

**Abstract author(s):** Badea, Elena (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICPI Branch, Romania; Department of Chemistry, Faculty of Sciences, University of Craiova) - Carsote, Cristina (Center for Research and Physical-Chemical and Biological Investigations, National Museum of Romanian History) - Sendrea, Claudiu (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICPI Branch) - Proietti, Noemi - Di Tullio, Valeria ("Segre-Capitani" NMR Laboratory, Institute for Biological Systems - ISB-CNR, National Research Council of Italy)

**Abstract format:** Oral

Characterization of historical leathers is a complex task because they are very heterogeneous mixtures of tanned (leather-like), un-tanned (parchment-like), gelatinised collagen, amorphous collagen, tannins, added and deterioration compounds. It is, therefore, difficult to obtain a complete picture of the deterioration state of archaeological leather without putting into play a multi-technical approach. In this research, ATR-FTIR spectroscopy, micro DSC, solid state and unilateral NMR spectroscopy was applied to identify different tannin families (condensed and hydrolyzable) or aluminium salts used in archaeological leather. Furthermore, archaeological leather deterioration with special focus on collagen gelatinization was investigated. The strength of our approach lies in combining surface and bulk, as well as qualitative, semi-quantitative and quantitative analyses. ATR-FTIR spectroscopy is a surface non-invasive technique that provides the identification of tannin types, added and deterioration compounds, while it is strongly limited in providing results regarding collagen deterioration due to the overlap of specific tannin and collagen bands. The micro DSC analysis is a bulk micro-destructive technique which allows us to quantify the collagen populations with distinct hydrothermal stability and characterize the overall behaviour of historical leather. This is fundamental to determine the long-term stability of leather artefacts but it requires taking microsample, which is not always allowed. Solid state NMR spectroscopy has the advantage of identifying tannins and lipidic compounds while providing information on collagen structural destabilization and conversion to gelatin. On the other hand, unilateral NMR is a very effective tool for understanding leather deterioration pattern from variations in macromolecular chains mobility. In addition, a wide database of NMR and FTIR spectra of vegetable tannins was also collected in order to characterize archaeological leathers.

5 CHARACTERIZATION OF ARCHAEOLOGICAL LEATHER. A MULTI-TECHNIQUE APPROACH FOR A CASE STUDY INVOLVING MEDIEVAL ARTEFACTS FROM ROMANIA AND UKRAINE

**Abstract author(s):** Micu, Maria-Cristina (Advanced Research for Cultural Heritage Group (ARCH Lab), National Research & Development Institute for Textiles and Leather, ICPI Division) - Carșote, Cristina (Center for Research and Physical-Chemical and Biological Investigations, National Museum of Romanian History) - Păunescu, Simona Maria - Caniola, Iulia Maria - Miu, Lucreția (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICPI Division) - Badea, Elena (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICPI Division; Department of Chemistry, Faculty of Sciences, University of Craiova)

**Abstract format:** Oral

Materials, whether natural or created by humans, sooner or later undergoes alterations as a consequence of interactions between their structure and environment. In case of archaeological leather, deterioration depends on the different type of ground in which they were buried. Leather is a complex material mostly consisting of a matrix of collagen chemically stabilized by various tannins, i.e. vegetable tannins, mineral salts or mixed vegetable and mineral tannins. Collagen is a fibrous protein which presents a distinct hierarchical structure, from molecular to microscopic levels. Over time, collagen degradation can occur at any level of its structure

and influence the physical-chemical, mechanical, aesthetic and use properties of leather objects.

The condition of archaeological leather can be assessed by a series of simple visual and physical examinations which determine the flexibility, strength and coherency of the fibers and then correlate these assessments with the condition of leather as determined by various chemical and physical-chemical analyses targeting each structural level of the complex collagen-tannin matrix in leather.

The aim of the present study was to set up a multi-technique approach, ranging from non-destructive and non-invasive to micro-destructive tests, from qualitative to quantitative and from surface to bulk analysis, to characterize archaeological leather. A comparison was made between the archaeological and historical leather physical –chemical proprieties and deterioration patterns.

Fifteen archaeological leather samples from Romanian and Ukrainian sites were examined using microscopy (optical and SEM), ATR-FTIR and XRF spectroscopy, thermal microscopy and microDSC. The acidity (pH) was also measured.

By correlating the results obtained using these techniques, details on both leather making technology and deterioration patterns have been revealed.

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## EXPERIENCE OF STUDYING ARCHAEOLOGICAL LEATHER FROM BARROWS OF THE SAYANO-ALTAI REGION (RUSSIA) BY SCIENTIFIC METHODS. PRELIMINARY RESULTS

**Abstract author(s):** Busova, Varvara (Institute for the History of Material Culture of Russian Academy of Sciences) - Brown, Samantha (Max Planck Institute for the Science of Human History) - Hommel, Peter (Oxford Centre for Asian Archaeology, Art and Culture, Institute of Archaeology)

**Abstract format:** Oral

On the territory of Sayano-Altai region (Siberia, Russia), archaeologists are frequently exploring barrows dating from VIII – III centuries B.C. Sometimes fragmentarily preserved organic items can be found inside of them: products, made of leather, textile, felt and wood. Due to their frequent occurrence, leather goods, such as scabbards, cases, bags, belts, appliques, quivers, flasks, and clothing items are of particular interest. Most often we find only a part of the object, and our possibilities for interpretation are very limited. But even then, we use traditional methods of analysis and the set of methods depends heavily on the preservation of the leather.

In order to taxonomically identify these small fragments of leather new biomolecular approaches need to be taken. In our case, the study of the role of domestic and wild animals in the costume complex of the late bronze age and early iron age on the territory of the modern Altai, Tuva, Minusinsk basin and other contact zones was made possible through the application of ZooM (Zooarchaeology by Mass Spectrometry). Using this method in conjunction with Cross-use with microscopy has allowed for a broader analysis of new customs and traditions of the leather and fur industry of the ancient Siberia.

The study of red pigments on the surface of scabbards, hats and bags using X-ray fluorescence analysis allowed us to obtain new data on the customs of the use of ochre and cinnabar by the ancient population of Tuva. In this report, we can talk about which research methods are most applicable in this situation, what data we expected to receive and what we now have from the data obtained by traditional and scientific methods.

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## CLOTHING OF THE XIONGNU: LEATHER GARMENT PRODUCTION IN PASTORAL COMMUNITIES OF THE IRON AGE STEPPES

**Abstract author(s):** Miller, Bryan (University of Michigan) - Brown, Samantha (Max Planck Institute for the Science of Human History)

**Abstract format:** Oral

The political economy of the first nomadic empire, the Xiongnu (ca. 200 BCE – 100 CE), relied heavily on trade in prestige goods, especially furs and silks. Yet household economies and production systems for local pastoral communities are scarcely understood. Textual records mention the importance of both wild animals and herd animals for clothing production – including felted wool, woven wool, and furs – and some fragments of wool and silk garments have been discovered. Bone and iron tools from sites across Inner Asia hint at the manners of processing animal skins, making leather garments, and sewing them. Nevertheless, while pieces of leather have also been found, fragments outside of the contexts of large royal tombs have yet to be fully investigated. By employing proteomic analyses of numerous fragments of leather garments from well-preserved burials of a small community in the dry alpine grasslands of western Mongolia, we are able to demonstrate an emphasis on domestic livestock for leather production.

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## SKIN, LEATHER, AND HIDE: SCIENTIFIC METHODS AND NOVEL APPROACHES TO THE STUDY OF ARCHAEOLOGICAL LEATHER

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Busova, Varvara (Institute for the History of Material Culture RAS) - Brown, Samantha (Max Planck Institute for the Science of Human History)

**Format:** Regular session

Undoubtedly, archaeological leather as a material for research has high informational potential. It can provide insights into the ways in which ancient communities lived and, how their traditions developed in connection with their physicality, community and the surrounding environment. Resulting changes in social development, hunting practices, animal husbandry, belief systems and fashion

were reflected in the types of animal skins used, skin processing and leathercraft. Archaeological skin products are rare finds and their preservation usually depends on very particular and often unpredictable factors. Moreover, the methods for scientific research of archaeological skin are dependent on the archaeological context in which these objects were found. To study leather we have access to an array of techniques including proteomic analysis, optical light microscopy, spectral imaging technologies, X-ray techniques, DNA analysis etc. Therefore, every time a new project begins one is faced with the choice of the most appropriate method to provide the most useful data, at a reasonable cost, and within an achievable time-frame. Which research methods are most applicable in a given situation, what data can we expect to receive and how can we build effective analytics based on the data obtained by traditional and/or scientific methods? We invite all leather researchers to participate in an active and productive discussion in this relatively understudied research area.

### ABSTRACTS

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## SKIN GARMENTS BEYOND SPECIES: INTEGRATING ETHNOARCHAEOLOGICAL AND SCIENTIFIC APPROACHES IN THE ANALYSIS OF ARCHAEOLOGICAL LEATHER

**Abstract author(s):** Pearson, Kristen (Harvard University)

**Abstract format:** Oral

Advancements in scientific techniques have created exciting new opportunities for the study of archaeological leather. With improved methods for species identification, it is increasingly possible to consider results obtained from archaeological leather within the context of the larger zooarchaeological record. However, leather objects are distinguished from most faunal remains because they represent material culture as much as they represent materials of animal origin. The human behaviors that coincide in the leather objects we study range from animal husbandry practices to craft production techniques to traditions surrounding wear, repair, and discard. Molecular analytical techniques, compelling and important as they are, emphasize only certain parts of this complex chaîne opératoire. In this paper, I will present the results of ethnoarchaeological fieldwork focused on exploring the social dimensions of leather garment production among nomadic pastoralists in Mongolia. Through collaborative, object-based interviews conducted at field sites in Central Mongolia and the Altai, it was possible to identify patterns in how wild and domestic animal resources are assigned value and distributed within and between households. Without assuming direct continuity between the past and present, these results suggest possible avenues of inquiry related to inequality, dependency, mobility, and subsistence strategies. Finally, I will present a case study integrating proteomics with ethnoarchaeologically informed technical analysis in the interpretation of a tenth century deel from the Mongolian Altai.

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## SO WHAT? HOW TO GENTLY KILL YOUR DARLINGS OR HOW TO COMMUNICATE TO AN AUDIENCE AS WIDE AS POSSIBLE

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Kienzle, Peter (LVR-Archäologischer Park Xanten) - Dunning Thierstein, Cynthia (Archaeoconcept Director)

**Format:** Regular session

While archaeology is an academic discipline and high-level intellectual dispute about archaeological theory and the best interpretation of the material culture is encouraged, archaeology is also a commodity in tourism business and sites welcome large numbers of visitors of various backgrounds.

Archaeological results are very specialized in-detail studies of particular narrow aspects of former societies or propose general theories on cultural development, presented at academic level in comprehensive papers or individual books of several hundred pages. However, archaeology is financed by “the public”. Therefore, “the public” claims its right to participate in the results of archaeological research. Since “the public” is a cross section of our society with a wide range of interests and intellectual properties, communicating the results of archaeological research requires an understanding of the target groups and requires a reduction of the complexity of the research results to simple but still true messages.

Museums, archaeological parks and sites have tried numerous and various ways to understand visitor perception and their approach to heritage and archaeology. Based on this understanding (or these assumptions), they developed various ways of communication ranging from reenactment and reconstructions or hands-on-experiences to signboards, popular publications and traditional museum exhibitions. In an ever-changing world, the new media replaced many traditional ways of communication and only recently, the emotional approach to archaeology by the visitors became mainstream. Furthermore, the sites, the ruins and the exposed walls communicate with the visitors just by being there. Still, the main objective is to bridge the gap between accurate academic results and the visitor’s demands.

In this session we would like to learn new ways to convey the message to the public. We would like to hear from practical experiences both successful and unsuccessful from university scholars, archaeological site managers, museum and tourism experts.



1 HERE WE ARE – WHERE WILL WE GO COMMUNICATION AT ARCHAEOLOGICAL SITES

**Abstract author(s):** Kienzle, Peter (LVR-Archaeological Park Xanten, Germany) - Dunning Thierstein, Cynthia (ArchaeoConcept Sárl, Bienne)

**Abstract format:** Oral

In 1748 the excavations at Pompeji started and two years later the excavation of the “Villa dei Papiri” in Herculaneum began. Ever since, archaeological sites attracted visitors. Fascinated by the remains of former cultures and societies, wealthy young people with an educated background, knowing the stories of Homer by heart, visited the excavation sites while travelling the Mediterranean on the Grand Tour. These privileged visitors, personally guided by the director of the excavation, had a comprehensive preexisting knowledge of the site and the historic period.

Traditionally, the basic understanding of communication at archaeological sites is based on a “knowing” expert, an archaeologist or excavator, and an “ignorant” audience, that needs to be taught the “truth”. Today, we know that a site may be understood under various perspectives: There is more than “one truth” to an archaeological site. The way to communicate with the visitor has consequently changed. The traditional “chalk and talk” teacher-centred instruction is outdated. Today, we talk about community archaeology and participation.

The rise and use of modern media results in higher expectations into the quality of communication on site or about the site but also offers almost limitless possibilities to visualize various aspects of a site or an object. Perhaps, it even may replace the experience on site completely. Since easier access to the sites is provided by popular tourism offers, the number of visitors to archaeological sites has increased enormously and sometimes causes severe harm to the most famous sites. Will future communication tools help to solve this problem?

This paper will trace the history of communication at archaeological sites and will sketch possible developments for the future, offering a starting point for a discussion on what kind of communication may be offered in the future on archaeological sites open to the public.

2 A GOOD STORY NEVER DIES. AN EXPLORATION OF STORYTELLING UTILISATION IN PUBLIC ARCHAEOLOGICAL OUTREACH IN THE NETHERLANDS

**Abstract author(s):** van den Hoek, Merel (University of Groningen)

**Abstract format:** Oral

Storytelling has become one of the buzzwords of the current century, and it appears in an abundance of contexts and disciplines, where it is always claimed to be used to great success. Simultaneously, it has been known that the communication of archaeology to the public can be improved, and that current methods of communication often result in boredom, lack of meaning and/or credibility, or incomprehension. Effective and meaningful communication is essential to archaeology in order to create general public support and, ultimately, financial backing for additional (research) projects. This is especially relevant in (Dutch) contemporary society, for the current focus (and financial support) is placed on beta-technical disciplines. The current study therefore regards storytelling as a possible means of effectively communicating archaeology to the public.

Storytelling, and related aspects such as meaning-making and narrative, are extremely difficult to specify. This especially holds true in an academic environment, where the subjectivity and emotional-focus of storytelling are generally considered to be out of place. The term might evoke the idea that storytelling is merely about popularising and/or fictionalising archaeology, but this judgement is too limited, as is argued in the current paper.

The current paper distinguishes four storytelling techniques (personalisation, emotionalisation, participation and plotification) and discusses these, and additional relevant aspects of communication through storytelling, by means of reviewing several archaeological outreach projects in the Netherlands. Most of these case studies were nominated and/or won the Dutch bi-annual national award for best archaeological outreach project.

The goal of proposing this framework is to further develop our perspective on public archaeological outreach and, ultimately, optimise our ways of communication.

3 WHAT THE SCIENCE OF STORYTELLING CAN TEACH ARCHAEOLOGY

**Abstract author(s):** Pruitt, Tera (University of Cambridge)

**Abstract format:** Oral

Archaeology is storytelling. Yes, it’s an academic discipline, but at its core, archaeology tells stories about the past. This is especially true when we bridge the knowledge gap in museums and public archaeology.

The problem is that our stories aren’t very good. We don’t train in the craft of storytelling. In fact, scientists often eschew the very idea because they conflate the idea of ‘story’ with ‘fiction.’ However, a story is just a way of conveying a series of events, or facts, in a way that resonates with deep structures in the brain. Science, with its highest aim of conveying fact, is constrained to tell the truth—but we aren’t constrained to tell that truth in a boring way.

This paper is from the perspective of a novelist who is also an archaeologist. It draws on recent research in the seemingly disparate, but deeply interconnected studies of neuroscience, screenwriting, and literary criticism to explore how humans are biologically wired for storytelling. Our brains respond to good stories in very particular ways—and we can use brain science and story craft to inform our presentation of archaeology.

This paper goes right back to Aristotle, who gave us blueprints for effective narrative. It describes neuroscience experiments and studies on ‘the psychology of curiosity’ that explain our addiction to certain archetypes and structural forms. It explores literary criticism that embraces the ‘affective,’ as well as digital humanities research that maps the most powerful way to effectively deliver stories.

Can real life ever compete with fiction? Absolutely. If archaeologists understand the science behind good storytelling—the biological triggers behind the structure of a good story that compel our brains to get excited and pay attention—our scientific stories can compete with the likes of ‘Ancient Aliens’ and Bosnian Pyramids in media, museums, and public archaeology.

4 NO GOLD, NO DINOSAURS... - AND NO, I HAVE NEVER BEEN TO EGYPT. FIGHTING CLICHÉES ON A DAILY BASIS

**Abstract author(s):** Schwenzer, Gerit (no affiliation)

**Abstract format:** Oral

Every archaeologist, sooner or later, is confronted with clichés and a variable portion of misunderstanding of his environment, mostly starting with friends and family, continuing to co-workers of other disciplines, passing on to the variety of media to finally arrive at the biggest audience: the real public. You face visitors at a museum or at the open day of an excavation, the unexpected guest at the excavation fence, children in school projects, the tour group at a guided tour etc. You are faced with different ages, different cultures and different approaches to archaeology and history, combined with different ideas and expectations.

On the one hand, these clichés unfortunately are well fed by the media, and partly by archaeologists as well, in the hope to keep people interested. On the other hand, archaeologists are trying to fight those clichés in exhibitions, presentations and documentaries.

This paper does not try to give an answer, never mind an ultimate solution, to the matter, rather than to start a discussion of experiences and suggestions on how we can face these issues in a better prepared way.

5 YOUNGSTERS, NETWORKING AND PARTICIPATORY APPROACH FOR ARCHAEOLOGICAL HERITAGE DISSEMINATION

**Abstract author(s):** Radchenko, Simon (New Archaeological School; University of Torino) - Tuboltsev, Oleg (National Reserve “Khortytisia”; New Archaeological School)

**Abstract format:** Oral

Understanding of archaeological site as a peculiar museum space is rooted into cultural heritage researches mindset for ages. The main topical trends for such spaces are digitization and participatory approach. These trends obviously affected the dissemination of archaeology as a type of activity, cultural product and identity element. However, even with a team of active participators at his disposal, archaeologist can’t focus on the cultural heritage popularization and follow the innovative approaches of it constantly. The main scholar’s tasks are heritage objects studying and interpretation, research provision and academic results publication. Altogether with the lack of financial support, reports writing and the general complexity of archaeological science all abovementioned creates an astonishing gap wall between researcher and his audience.

Though stated problem seems to be hardly solvable, there is a simple way it can possibly be dealt with. A team of directly involved into research process non-archaeologists should become a missing link between the scientist and broad audience. This will implement the participatory approach to archaeological heritage dissemination in addition to excavation process. Volunteers often don’t have any organizational or scientific duties and capable of public communication qualified enough to successfully disseminate the results. Moreover, they understand the target audience, public interests and social-media strategies, which archaeologist usually don’t.

Unlike many European countries, Ukraine allows underage and non-professional volunteers to participate the excavation process. This adds some options for the activity of archaeological NGO’s. For instance, “New Archaeological School” involves teenagers to excavation for 18 years. However, recently high-school students from there were introduced to the participatory approach for promotion of science, archaeology and cultural heritage. Many approaches that were barely implemented into Ukrainian archaeological informational space arose from that innovation. Young participants proved to be efficient bridging the gap between the academic results and wide audience.

6 **HOW TO GET A FEEL FOR THE PALEOLITHIC: MUSEUM OF THE STONE AGE IN THE GARAGE.**  
**Abstract author(s):** Sevastyanov, Nikolay - Margarita, Kholkina (Saint Petersburg State University) - Direktorenko, Anastasiia (Saint-Petersburg Academy of Fine Arts) - Korneva, Tatiana (Institute of Archaeology of Russian Academy of Sciences) - Atnagulova, Elena (European University at Saint Petersburg) - Ashikhmin, Alexey (Saint Petersburg State University) - Ivitskaya, Anna (Military-Historical Museum of Artillery)

**Abstract format:** Oral

Sometimes even well-organized popular scientific archaeological exhibitions are faced with the challenge: visitors to the exhibition memorize only a small part of the information.

This is partly due to the particular feature of the archaeological material — generally artifacts are separated by time (unless, of course, this is an exhibition of a single complex) and it is very difficult for a non-expert spectator to process the information.

Some museums partially solve this problem by using a color code, using different colors in the design of museum halls dedicated to certain archaeological periods. This is a classic mnemonic device that allows you to memorize the information more effectively. This technique is similar to the colored "timelines" used in schools in history classes.

However, in addition to color coding, there are other ways in mnemonics to manipulate the perception in order to improve memory. Furthermore, the matter of choosing a color is much deeper than it may appear at first glance.

Given all this, we decided to try something new: we turned a garage into a kind of testing site for exhibiting Stone Age artifacts, where we alternately displayed the copies of stone tools to visiting groups. Such setting allowed us to abstract from the complexities associated with museum activities. In his report we describe how we organised the environment, set up the sound effects, picked the color scheme, calibrated the light depending on the site of discovery, period of use and characteristics of the exhibited artifact in order to help the visitors better memorize the information, using, among other things, mnemonic devices. This allowed to stimulate interest in the items and thereby increase the amount of information remaining in the spectator’s mind after visiting the exhibition.

7 **ARCHEOLOGY AS AN AGENT OF PERSONAL AND SOCIAL DEVELOPMENT. THE PEDAGOGICAL WORKSHOP IN TONGOBRIGA AND THE PROFESSIONAL SCHOOL OF ARCHAEOLOGY**  
**Abstract author(s):** Nunes, Susana - Pinto, Dulcinea (EPA)

**Abstract format:** Oral

Teaching Archaeology at a vocational, secondary, pre-Graduate level in Tongobriga (Northen Portugal) is largely defined by the educational project of the Professional School of Archaeology (EPA). In September of 2019, EPA, in partnership with the Archaeological Site of Freixo, conceived a pedagogical space for the public. This space aims the preservation of a site that is both an Archaeological site and a National monument, in addition to granting the valorization of the professional in archeology and its connection to civil society. The awakening of this awareness led us to the creation of a set of activities that allow the training of our students for the dissemination of archaeological practice.

The activities are of an interdisciplinary and collaborative nature among all educational agents, allowing an awareness of the concepts of identity and historical belonging that is sought to promote. The pedagogical space includes an archaeological excavation simulation workshop and an exhibition. The workshop, set adjacent to the habitational area of the Archaeological site of Tongobriga, recreates three of the main chronological periods identified in the Archaeological site during the 40 years of excavation and investigation. These are as follows – Iron Age, Roman Period and Medieval Period. This workshop also intends these participants to apply the principles of the Scientific Method in gathering, classifying and analysing the Archaeological data and in doing so developing initiative, planning, execution and interpretation skills sets. The exhibition is an extension of the workshop that allows to know all aspects directly related to archaeological field research, namely the collection, registration, interpretation and dissemination of data collected during an archaeological excavation. The pedagogical space thus provides a link between scientific knowledge, institutions - School, Archaeological Site - and the community, demonstrating its relevance in promoting the local heritage.

8 **LA BIAGIOLA AND THE AREA DEL TUFO: A NETWORKING PROJECT FOR PUBLIC ENGAGEMENT IN RURAL AREAS**  
**Abstract author(s):** Sola, Giulia (Bangor University, Wales)

**Abstract format:** Oral

The aim of this paper is to unpack the definition of public perception of in-situ archaeology and analyse the role that an archaeological site might fulfil in its own territory. Considering the public engagement in communication of archaeological contents, a series of successful good practices will be discussed with a focus on the central role played by archaeologists and local stakeholders.

We will present the case study of the “La Biagiola” archaeological site (Grosseto, Italy), which has been excavated by Italian no-profit “Associazione Cultura e Territorio” (ACT) since 2012. The peculiar location of the site allowed the development of a specially designed enhancement project, at the core of which stands the partnership between the archaeologists and La Biagiola Winery, owner of the land where the site lies on.

Thus far, the project has developed as follow: firstly, since 2016 the site has been opened to the public, in order to gather feedback

instrumental to the planning of an archaeological park and to increase the awareness of the site in the already well-known area of Sovana. Secondly, a series of cultural events have been planned, blending archaeological guided visits and cultural events hosted by the winery, alongside the usual wine-tasting tours. Lastly, the history of the site has influenced the winery marketing and production, for instance with the revival of the roman cocciopesto technique in winemaking.

The successful experiment of La Biagiola has recently been involved in a new project of integrated cultural networking in the Area del Tufo, started in 2019. The research aimed to elaborate a regional-scale model of cultural networking for extra-urban areas, starting from the investigation of the public of in-situ archaeology and exploiting the spatial interconnections between the three main strong points of the area: cultural and natural sites, and local businesses and facilities.

9 **ACCESSIBILITY AND INCLUSION IN SWEDISH CONTRACT ARCHAEOLOGY – TOOLKIT AND KEY RESULTS FROM PROJECT FUTARK**  
**Abstract author(s):** Engström, Elin (Stiftelsen Kulturmiljövård)

**Abstract format:** Oral

How can we make contract archaeology accessible to all? Involvement in society and heritage on equal terms is a human right. This also applies to contract archaeology.

In accordance with National Cultural Heritage Policy in Sweden, contract archaeology should create scientific knowledge relevant to archaeological and heritage management professionals as well as to the general public. Communicating these results to the public is today an important part of Swedish contract archaeology. For many, this arena is one of few places where the general public can come into direct contact with archaeological field work. It should therefore be accessible to all. However, it is our experience that we both need to improve accessibility to and learn more about how people with different disabilities experience contract archaeology today.

Project FuTArk - Funktionsrätt, Tillgänglighet, Uppdragsarkeologi (Disability Rights, Accessibility, Contract Archaeology), is a 3-year project funded by the Swedish National Heritage Board. The aim of FuTArk is to identify what makes contract archaeology’s public outreach inaccessible to a wider audience, and to, together with the disability movement, develop new methods and accessible solutions. Our goal is to find ways to make archaeology and cultural heritage both accessible and relevant for all, and for accessibility and inclusion to be an integrated part of Swedish contract archaeology’s public outreach. To achieve this, it is important to both explore new inclusive pedagogical methods as well as to encourage dialogue between the disability movement, contract archaeology and heritage management officials.

In this paper we present the key results from project FuTArk – a toolkit for creating an inclusive and accessible contract archaeology.

10 **INCLUSIVE APP GAME ON NEANDERTHALS**  
**Abstract author(s):** Riethus, Anna (Stiftung Neanderthal Museum; BSVN e.V.)

**Abstract format:** Oral

At the Neanderthal Museum, Germany, we are currently developing an inclusive app game together with blind and visually impaired people. The objective of the project “NMsee” (2019-2021) is to create an audio- and tactile-focussed tour through the permanent exhibition on Neanderthal Culture and prehistory. We aim to provide access for the visually impaired as well as to create an engaging new offer for all other visitors. To achieve the objectives we work together with the BSVN e.V. (federation of blind and visually impaired in the North-Rhine area). Furthermore, we continuously test our game with visually impaired people within our iterative design process. While not focussing on the traditional visual way of museum visits and by approaching different ways of interaction with archaeological content, we aim to reach out at a larger and more diverse audience.

In the paper I will present our project and the game design. I will inform about the ups and downs of the development process and the iterative design, the pitfalls of creating inclusive offers and the current feedback on our game from the tests.

11 **IMPORTANCE OF CULTURE-SPECIFIC MEANINGS OF TERMINOLOGY IN COMMUNITY-BASED STUDIES**  
**Abstract author(s):** Yalman, Nurcan (Nişantaşı University, Istanbul. Department of History)

**Abstract format:** Oral

This paper will address the issue of terminology and its variable perception in different cultures.

Although many cultural heritage professionals or researchers work in different parts of the world, they still use standard terminology which is derived from various statements, agreements of UNESCO, ICOM, ICOMOS and scientific articles in which the majority has been written in European languages. In the professional level to use a shared language might be thought to create a synergy but especially for the ones who work with communities, culture-specific meanings of some of the words have utmost importance in terms of communication. People have perceptions about everything surrounds them and the content of any term gains its meaning according to the background (common historical or personal) of that specific culture. This affects people’s decisions, acts and thoughts against various situations.

In this paper, I will discuss the culture-specific nature of “HERITAGE” as a term/word which has very common usage in culture sector and how it affects communication with communities in Turkey.

RE-MAKING THE CELTS

**Abstract author(s):** Collis, John (Dept of Archaeology, University of Sheffield)

**Abstract format:** Oral

Since the 1980s I have been questioning the way in which ‘Celt’ and other ethnic terms are used in the archaeological literature, the media and exhibitions. However I find not only that it still pervades the profession, but even people I have taught are loathe to abandon it, especially when talking of ‘La Tène Art’. For me it is not simply a change of nomenclature but also of paradigm. Typically the greatest resistance to change comes from scholars brought up in traditions they are not willing to abandon, while more popular writers simply have not heard or not understood the significance of change. My main approach has been to look at the historiography of such terms, and how they have been misunderstood, or, in the case of the 1930s, used for racist interpretations of the past. What is the reason for the continued use? Within the profession there are arguments (e.g. from linguists and art historians) that they understand the problems so there is no need to change (even when one points out inconsistencies), or simply that they disagree with the new paradigm. Another problem is that old ideas will still appear, e.g. in new editions of old books, or the uncritical reading of them, or the problem of, for instance, the cost of updating museum displays and tourist information panels. There is also a problem with the media, especially television where production is controlled by non-specialists, and where simple snappy titles and concepts are preferred, in some cases even when the presenter objects. I have no solutions other than to continue trying to persuade people that the new ideas are important, interesting and exciting to the specialists and the wider public as we rethink our past.

a. VISITORS PERCEPTION OF ARCHAEOLOGY THROUGH THE SEMIOTIC ANALYSIS OF THE INTERPRETIVE PANELS OF THE ARCHAEOLOGICAL SITE OF OLYMPIA, GREECE

**Abstract author(s):** Koutsios, Asimakis (University of Patras) - Eliopoulos, Demetrios (Ionian University)

**Abstract format:** Poster

A serious problem that archaeologists encounter constantly is the way in which visitors of archaeological sites interpret the material remains of past human activity. The question they repeatedly ask is about the capability and opportunity of visitors to interpretatively approach the past only through viewing and observing the archaeological remains without the support of verbal and/or visual information. By referring to the problem of presenting and interpreting the past in archaeological sites, this study aims to demonstrate the importance of verbal and visual communication, which consists of the transmission of information through the production of interpretive panels for use in archaeological sites. Choosing as a case study the archaeological site of Olympia (Greece), an attempt is made to evaluate the contribution of interpretive panels to enhancing the public dimension of the archaeological science and the ways in which archaeological information is presented to the general non-specific public, through semiotic analysis of the contained messages in the interpretive panels of the archaeological site.

GENDER AND ARCHAEOLOGY FOR NON-SPECIALIST AUDIENCES [AGE]

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Masriera-Esquerri, Clara (Universitat Autònoma de Barcelona - UAB) - Dempsey, Karen (National University of Ireland - NUI) - Martins, Ana Cristina (IHC-University of Évora; Uniarq - University of Lisbon) - Angliker, Erica (University of Zurich)

**Format:** Regular session

This session’s aim is to discuss and share practices of knowledge transfer that include gender perspective. Such practices can vary but generally they need to be designed for the non-specialist audiences in archaeology. They can range from lectures in university, but also workshops about the past in schools or museums. For example, school workshops for primary and secondary schools that talk about stereotypes in the past could give a more diverse image of the past communities (children, women, old people, etc.). Or workshops for the general public that give value to women’s work in the past, like sewing, caring for children and old people, food production, and so on. We would like to focus the session not only on sharing those practices but also on discussing whether they have been evaluated and how, namely whether the gender discourse has been included in presentations, talks and exhibitions to the non-specialist audiences.

ABSTRACTS

1 MAKING ANCIENT WOMEN VISIBLE: TEACHING ARCHAEOLOGY AND GENDER FROM THE PRIMARY SCHOOL TO THE UNIVERSITY LEVEL

**Abstract author(s):** Angliker, Erica (University of London, Institute of Classical Studies)

**Abstract format:** Oral

Although women made a relatively small mark in the history books of the ancient world, their existence is abundantly confirmed by archaeology. Indeed, various studies in this discipline—as well as in ancient history—have shown that women occupied a number of roles in ancient societies, ranging from mothers to Emperor’s wives, from priestesses of high status to lower class citizens, and from high ranking foreigners to actual rulers. Women could be found in variety contexts within the ancient world, including but not limited to the political, religious, military, and domestic sphere, where they exercised their power outside but also within the

limitations imposed on their gender to become leaders in their own way. But though the role of women in ancient societies is now recognized, thinking with gender in mind when studying the past remains a challenge that requires well-defined strategies for translating the data encountered in archaeological records into practical applications. In this paper, I will discuss two different techniques that I have developed while preparing lectures on the sanctuaries of Apollo on Despotiko and Paros, which I have been excavating and researching. First, I will speak about strategies for making women visible in primarily school lessons on archaeology and ancient religions. Using archaeological data that refers to women—particularly young women—and contrasting their realities to those of young audiences, I am able to draw attention to their roles at ancient sanctuaries. Afterwards, I will speak about strategies for making women visible in courses in ancient Mediterranean archaeology and art history aimed at undergraduate students of history and literature. Here I pay particular attention to normally overlooked materials.

2 BETWEEN ART AND SCIENCE – THE DIORAMA AS MEDIATOR OF LIFE IMAGES IN PREHISTORIC ARCHAEOLOGY

**Abstract author(s):** Heisig, Sophie (Freie Universität Berlin)

**Abstract format:** Oral

Among the various possibilities of depicting former living worlds, the diorama plays a special role. Three-dimensionality, high aesthetics and artistic qualities makes it an outstanding mediator of life images since the early beginnings of pictorial illustration of prehistoric life. Despite the increasing use of digital media, dioramas are still an integral part of many archaeological exhibitions, and often form highlights. Finds and findings from prehistoric times can be explained to non-expert visitors in an entertaining and understandable way - oftentimes better than mere inscriptions or the objects themselves can do.

However, it is in the nature of prehistoric archaeology that past worlds can only be reconstructed on the basis of a few material clues. Results often remain vague and debatable, gaps in knowledge must be filled with probabilities or speculation. It seems inevitable that modern premises are included in the reconstructions and typical gender clichés and stereotypes are produced and reproduced.

Despite the shaky ground of prehistoric reconstruction, the diorama claims to depict reality as accurately and wholly as possible. Its thereby generates an authoritative truth. Viewers are to be convinced by illusion and aesthetics. They look at an artificial static space without room for alternative interpretations. The fundamental question therefore arises as to whether dioramas are proper instruments in archaeological exhibitions. Are they, as dusty showcases, possibly long outdated by digital exhibition media?

This paper attempt an answer to these questions and therefore gives a basic overview of the diorama as an exhibition medium. Only against the background of its historical development, it seems possible to classify and evaluate dioramas in prehistoric archaeology in the present time.

3 PUTTING OUR HEADS ABOVE THE PARAPET TOGETHER: HERITAGE, GENDER AND COLLABORATIVE WORKING

**Abstract author(s):** Dempsey, Karen (National University of Ireland, Galway)

**Abstract format:** Oral

Within the context of public heritage and interpretation of castles, gender is perceived as the visibility and authentic representation of women, as defined by historical sources. Gendered interpretations of castles remain focused on the exceptional stories of named, elite women, privileging historical sources and placing maximum value on authenticity as defined by the written record. During the course of my Marie Skłodowska-Curie Fellowship, I completed a workshop that brought together heritage practitioners and academics from across Britain to jointly discuss approaches to gendered interpretation in confronting the Authorised Heritage Discourse of militarism in the public interpretation of medieval castles. This collaboration helped to identify the overarching aims for the gendered interpretation of castles; participants reflected on what makes a ‘good’ or ‘bad’ gendered interpretation in relation to castles; and how and why the AHD of militarism continues to bias public interpretation at castle sites. The results of this workshop informed a co-written publication on the same topic with some participants from the workshop. This paper is a reflective account of the successes and failings of the workshop and collaborative paper as well as highlighting the challenges and rewards in communicating gender.

4 CROSSING THE MIRROR: HERE, THERE AND BEYOND.

**Abstract author(s):** Schick, Andrea - Comendador Rey, Beatriz (University of Vigo, GEAT)

**Abstract format:** Oral

Mass media are a system of immediate and effective communication, forming a mass culture constituted by symbols, myths and stereotypes by individuals as a form of “industrialized production of reality”. The incidence of historians and/or archaeologists in this specular image is scarce and even includes a stereotyped image of archaeology. Both the most distant scientific discourse, and the language of the so-called “high disclosure”, are not easily accessible and can turn out to be ambiguous or complex, quite the opposite that in the field of advertising, where language has been increasingly stronger, more direct and graphic. However, marketing brings little or no information, because it mainly does use of myths, clichés and dreams, a collection of images true or false, that modern man has associated with prehistory and antiquity.

We must cross that mirror distorted and distorting image of the past, which the consumer society creates, projecting its own. How-



5

## IMAGE, MEMORY AND EMOTION: GENDER AND ARCHAEOLOGY FOR NON-SPECIALIST-AUDIENCE IN PORTUGAL

**Abstract author(s):** Martins, Ana Cristina (IHC - pólo Universidade de Évora; Uniarq - ULisboa)

**Abstract format:** Oral

The gender studies are recent in Portuguese archaeological research. The reasons for this are certainly several but they are mostly related to the specificity of the political and social contemporary history of the country. A situation that did not change substantially during the last 46 years of democracy, as androcentric narratives are still prevailing. And even a superficial analysis of archaeological activities in Portugal confirms that not much has having been done from an education point of view in order to talk about stereotypes in the past and give value to women's work in the past. Moreover, there is an almost total absence of the gender discourse from presentations, talks and exhibitions to the non-specialist audiences. Why?

Answering this question demands, at least, to: 1. Understand the State of Art of gender studies in Portugal; 2. Comprehend the State of Art of Public Archaeology in the country; 3. Analyse school books to get aware of the presence/absence of eventual gender stereotypes; 4. Analyse museum exhibitions and catalogues to identify gender issues.

Aditionally, we propose to present an activity that could be used, not only in Portugal, but eventually all-across Europe and even wider. An activity that aspires to be interdisciplinary as it should bring together different academic disciplines to solve a problem common to different territories and communities. An activity that will use theoretical tools and methodologies borrowed from, at least, history of art, heritage, public archaeology, history and theory of memory and emotion.

6

## THE FLINTSTONES IN SAXONY-ANHALT? WHAT ADNA AND ISOTOPE ANALYSES CAN TELL US ABOUT KINSHIP RELATIONSHIPS - AND WHAT THEY DON'T

**Abstract author(s):** Berndt, Milka (Freie Universität Berlin)

**Abstract format:** Oral

15 years ago four Neolithic graves with multiple burials were excavated near the village of Eulau in Saxony-Anhalt/ Germany. In the graves were thirteen individuals - five adults and eight children who were victims of a violent conflict 4500 years ago. The alignment of the thirteen dead in the graves, facing each other, some holding hands, quickly suggested a close relationship between the buried during their lifetime. The results of the strontium isotope and aDNA analyses carried out on the skeletons finally brought the graves to world fame. Some of the buried turned out to be close relatives. It was even possible to establish a relationship between father and mother and their two biological sons.

A little more than a decade after the first publication of the Eulau graves, we now have numerous interpretations of the Eulau graves from both the scientific and popular fields. There is talk of the earliest evidence of a nuclear family or even of an act of revenge provoked by the robbery of women.

The interpretations of the Eulau burials are - like other interpretations of archaeological findings - marked by gender clichés and stereotypes. In my presentation, I would like to point these out and question them. How far can and should the archaeological interpretation of scientific results go?

7

## WHEN ARCHAEOLOGY RESEARCH IS A TOOL TO UNDO GENDER STEREOTYPES IN PRE AND PRIMARY SCHOOL

**Abstract author(s):** Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona)

**Abstract format:** Oral

Archaeology heritage is gendered; thus, it continues representing social gender stereotypes when it is transferred to the non-specialists' audiences. In particular, we want to focus our attention to the early school stages, where we observe that non-equitative roles are assumed by children, and that they imagine life in the past assuming traditional and patriarchates roles.

Taking into account gender perspective, and to work for the coeducation, we have developed a series of workshops for pre an primary school to break the tendency of explaining prehistory simplifying men hunting and women in the caves with children. We have opened the point of view introducing women, boys, girls and ancient people in our explanations and workshops, as well as highlighting women's work.

The resources used are tales, animal toys, dolls, replicas of different archaeological cultural material and coloured pigments. The methodology that we followed have change traditional narratives to explain prehistory, we take into account the non-binary language and the relational aspect: active listening, assertiveness, dialogue, paraphrasing, teamwork, respect, empathy, creativity, etc

The result is a more social inclusive perspective of the past.

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## MEDIEVAL URBAN PARISH-CHURCHES: AN ARCHAEOLOGICAL PERSPECTIVE

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Istrate, Daniela Veronica (Vasile Pârvan Institute of Archaeology, Bucharest) - Szócs, Peter (County Museum Satu Mare) - Dumitrache, Marianne (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart - Esslingen, RFG)

**Format:** Regular session

Parish-churches are representative monuments of medieval urban life, significant not only for the local community, but also on regional level. Some of them keep their medieval structure and form, while others were transformed or destroyed. Preserved entirely or partially, the parish churches and the surrounding churchyard cemeteries, are witness and exceptional source of social and economic aspects, material culture and first of all spiritual life of medieval urban society. The building of the church, with stages from Romanesque through Gothic and early modern times, its decorative fittings, equipment and furniture are the result of outstanding and long lasting efforts of the urban communities, comprising local and long-distance experiences. Moreover, churchyard cemeteries provide first-hand source on the local community, especially through the anthropological data and the rich series of grave-goods.

The regional and long-distance contacts of urban communities, through trade and other economic and social relations, are well documented in written sources and these contacts create a solid background for establishing direct links between the town's parish churches, their architectural and artistic features and the connected material culture.

This session aims to create a complex perspective on the archaeologically research of major parish churches of the Carpathian Basin, widening the analysis to the connected buildings and cemeteries. Papers focusing on case studies are welcomed, but authors are encouraged to consider the material culture connected to the church and the surrounding cemetery, the detectable elements of cult, and especially the regional and long-distance connections as a possible element of network formation. Several papers will present the Transylvanian parish churches of Braşov (Brassó/Kronstadt), Sibiu (Szeben/Hermannstadt), ClujNapoca(Kolozsvár/Klausenburg), Baia Mare (Nagybánya/Neustadt) – all of them placed on the main north-south trade route which connected medieval Hungarian Kingdom with Poland and the Levant. Similar cases from Carpathian Basin and beyond are welcome.

## ABSTRACTS

1

### THE MEDIEVAL PARISH CHURCH OF BAIÁ MARE / NAGYBÁNYA

**Abstract author(s):** Szocs, Peter Levente (County Museum Satu Mare)

**Abstract format:** Oral

The town of Baia Mare was one of the most important mining and minting centers of medieval Kingdom of Hungary. The earliest privileges of the town are known from the royal charter of King Louis Anjou, the Great, issued in 1347, confirmed and extended in 1376. According to these charters the community of the town enjoyed considerable liberties: they had the right to elect the town-judge and the parish-priest, they had judicial autonomy, including the capital cases, and they could build a town-wall. The commercial privileges included the right to keep a weekly market and an annual or country- fair. Due to the rich mineral resources and the liberties, the town became one of the biggest and richest settlement of the Kingdom, at the end of the 15th century.

The privilege of 1347 mentioned the ongoing building of the parish church: it allowed the citizens to use the royal forests to get building materials, and granted the half of the tithes to this purpose. Several decades later, in 1387, the community of the town made an agreement with the parish priests, that he should keep, beyond of him, eleven chaplains and one more preacher. This suggests, that the church was finished already, and it was considerably large. The church was extended and rebuilt during the next century, resulting one of the most important monument of the Gothic architecture of the region. Unfortunately, the church was demolished in 1847, as it was several times modified and damaged during the Reformation and Counterreformation. Its foundations were revealed through archaeological researches, organized by the local museum, and conducted by archaeologist dr. Dan Pop, in 2012–2014. The presentation will give an overview of the results of these archaeological researches.

2

### COMPLEX TRANSFORMATIONS OF THE CHURCH OF THE ASSUMPTION OF THE BVM IN GORA, CROATIA, AND THEIR MANIFESTATIONS IN ARCHAEOLOGICAL MATERIAL

**Abstract author(s):** Belaj, Juraj (The Institute of Archaeology, Zagreb) - Sirovica, Filomena (Archaeological Museum in Zagreb) - Stingl, Sebastijan (The Institute of Archaeology, Zagreb)

**Abstract format:** Oral

The Church of the Assumption of the Blessed Virgin Mary in Gora, Croatia, went through different complex transformations, depending on its various owners and their needs. The first church (or two sequential churches?) in the Romanesque style was built here during the time of Christianisation, probably in place of a former pre-Christian Slavic tribal territorial unit. The church's two semi-circular apses were discovered during archaeological excavations. During the reign of Bela III of Hungary, the Knights Templar gained possession over the church and in the mid-13th century, they demolished the old and built a new, high-quality Gothic church. As well as other estates that formerly belonged to the Knights Templar, after 1312 it was inherited by the Knights Hospitaller. The church was built on with time, and it was considerably redecorated and extended in the Baroque. Until it was blown up by large number of mines put inside the church in the 1990s war, the only thing that had revealed its Gothic origin was the floor plan. But that brutal

act revealed multiple original Gothic elements beneath the Baroque interventions, and after the war, the church was reconstruction in the Gothic style, with a couple of compromises and clashes of conservator-restorers’ concepts with those using the object. The restoration of the church was followed by salvage archaeological excavations, which, among other aspects, explored 424 graves dating back to different phases of the church’s history. Authors will show how architectural remains and grave findings correspond and provide evidence of the shifts in the importance of this area, but also of the traffic route this church was situated on during the Middle Ages and the modern period. Their characteristics are a clear reflection of changes in social and economic relations which marked the history of the surrounding area.

3 **TARGSORU VECHI A LINK BETWEEN NORTH AND SOUTH CARPATHIAN AREA**

**Abstract author(s):** Magureanu, Andrei (Institute of Archaeology) - Ciuperca, Bogdan (Prahova County Museum of History and Archaeology)

**Abstract format:** Oral

One of the important Wallachian medieval towns, Târgșoru (Prahova County, Romania) was, at a certain moment, the most involved in the commercial relations with Brașov. Due to this Târgșoru was first mentioned in medieval documents 600 years ago. The commercial importance of Târgșor comes out also from the fact that from here depart, in 1502, a number of 83 saleable transports to Brașov, more than those from Câmpulung or Târgoviște. Its medieval ruins, and the vestiges of three churches in particular, were those to first draw the attention of historians and architects. The archaeologists started their work here more than half a century ago, in 1956. Those investigations succeeded to give us a better understanding over many aspects of the old town of Târgșor. In the present paper we try to briefly present the development of the archaeological research at the site, to identify the investigated medieval monuments and to draw a possible scenario for the chronological evolution of the medieval town, from its parish point of view on one side, and from commercial connection on the other side.

4 **THE BLACK CHURCH OF BRAȘOV/KRONSTADT: PREMISES, SITE EVOLUTION AND IMPACT ON LOCAL ARCHITECTURE**

**Abstract author(s):** Istrate, Daniela Veronica (“Vasile Pârvan” Institute of Archaeology, Bucharest)

**Abstract format:** Oral

The Lutheran Church of Brașov, known especially as the Black Church after the fire of 1689, is one of the most important churches of Transylvania. Built during the Middle Ages as the parish church of the catholic Saxons’ community of the town, with the title of the Holy Virgin, it was for a long time the largest Gothic building in the region. The monumental church was built in a late Gothic style, under the influence, and possibly with the direct contribution, of great European building sites, among which that of St. Sebaldus Church of Nuremberg (for the architecture and decorative design of the choir), respectively that of St. Elisabeth Church of Košice, Slovakia (for the western side, aisles and especially the portals).

Its building site, whichever it was, worked almost continuously for one century starting with the last decades of the 14th century, producing a modern building for its time, in which both the choir and nave were each composed of three aisles equal in height. Although its current shape is apparently uniform, detailed archaeological and architectural investigations have evidenced several anomalies in the church’s structure, which for now, cannot be explained entirely.

On the exterior of the church, an archaeological research was made during 2012 and 2013, which completed the information on the building preceding the church and on the surrounding cemetery, bringing also new data related to the proper development of the construction. The proposed paper will analyses this church based on available data, emphasizing its place and role in the creation of the Transylvanian urban ecclesiastic architecture.

5 **ARCHAEOLOGICAL INVESTIGATIONS AT SAINT MICHAEL’S CHURCH IN CLUJ (KOLOZSVÁR, KLAUSENBURG)**

**Abstract author(s):** Lupescu, Radu (Sapientia Hungarian University of Transylvania)

**Abstract format:** Oral

The parish church of Cluj is a representative religious building not only for the medieval local architecture of Transylvania, but also for a wider region of Central Europe. It displays particular stylistic features dated in the second half of the fourteenth century and for the whole fifteenth century. Since it can be considered a late medieval building, the early parish church of Cluj was always on unsolved question for the urban development of the town. The archaeological investigations of the past few years offered an opportunity to survey the church and to better understand its beginnings and evolution. The team had also the opportunity to reveal some parts of the cemetery, offering interesting clues to medieval burial practices. The present paper, with main focus on the architecture and cemetery of the church, aims at to deliver the latest results of this archaeological survey which until now was the only one carried out there.

a.

**THE ST. MARGARET’S CHURCH OF MEDIAȘ: METAMORPHOSES OF AN URBAN CHURCH**

**Abstract author(s):** Dumitrache, Marianne (Landesamt für Denkmalfpflege im Regierungspräsidium Stuttgart - Esslingen) - Istrate, Daniela Veronica (“Vasile Parvan” Institute of Archaeology, Bucharest)

**Abstract format:** Poster

The Lutheran Church of Mediaș is one of the most important Gothic urban churches of Southern Transylvania. Today it presents in its complexity a late Gothic look, developed on a three-aisled basilical structure. A monumental western tower, with a peculiar building-history, rises on the west side, while a sacristy lies north to the choir, the church being surrounded by a strong fortification composed of successive enclosure walls and numerous towers. The architectural details of church are generally of high quality, and the building is known for its valuable wall paintings, too. Its architecture was influenced by the construction of the parish church of Sibiu, however details regarding the workshop or workshops to which we owe its current shape are unknown.

The 1972-1974 archaeological excavations conducted on relatively large areas during its restoration, have shown that the apparently homogenous church had a rather complicated early stage and a similar evolution, which remained unique in the region. Originally, a Gothic choir flanked by side chapels was built at the end of the 13th century, together with a tower, which lay at a rather great distance to the east. Almost one century later, the construction was resumed and it was attempted to build a single aisle church, which eventually was transformed into a Gothic basilica, completed only in the first half of the 15th century.

The poster proposed, analyses the evolution of the church of Mediaș, and of the surrounding cemetery, laying emphasis on the value of this find for understating the urban architecture in context of Transylvania and more widely in the Carpathian Basin.

b.

**THE CHURCH “ON THE HILL” OF SIGHIȘOARA**

**Abstract author(s):** Istrate, Angel (Cultural Association Hieronymus, Brașov)

**Abstract format:** Poster

The former parish church, called “on the Hill” of Sighișoara (today in Lutheran service, formerly a catholic church, dedicated to St. Nicholas), is one of the most important parish churches of medieval heritage from Transylvania. The church is a Gothic building built during the 14th and 15th century. The present building reused former structures, and it was completed only around 1500, thus its construction site extended over a quite long period, experiencing all stages of the provincial Gothic style and producing one of the most successful examples of the local ecclesiastic architecture. The edifice survived in its original form with insignificant additions or changes, the most important at vaults’ level, which had to be rebuilt in the modern period subsequent to a number of earthquakes. Beside the spectacular architecture, the church is noteworthy by its interior paintings, preserved in a rather significant proportion, the sculptures which embellish the choir exterior and the valuable stone or wooden furniture pieces – all these 15th century or early 16th century Gothic works of art.

Beyond its special art and architecture monument, the church is evidenced by a few interesting peculiarities: its layout is asymmetrical, almost twisted, the choir is built on two levels while the polygonal apse lies on a circular base. The emergence of such a ground-plan on a relatively regular plateau indicates the existence of preceding buildings, which, at different dates of the site, influenced and conditioned the decision of the builders. The archaeological excavations carried out during the 1990’s, clarified the preceding constructions and brought numerous additional information on the evolution of the current church and its cemetery. The poster will presents briefly the results of this research.

**MEDIEVAL MINING DISTRICT. A EUROPEAN LANDSCAPE PERSPECTIVE**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Haggren, Georg (Archaeology, Department of Cultures, University of Helsinki) - Magnusson, Gert - Karlsson, Catarina (Jernkontoret)

**Format:** Regular session

The industrial and mining districts of Europe have contributed since prehistoric times to the exchange of mining and metallurgical ideas as well as trade to change and develop different societies. Societies were connected in networks of humans and their ideas. Systematic investigations and surveys increase our knowledge of the extent of medieval iron, copper and silver production significantly. Together with an interdisciplinary approach, this provides a great opportunity to get a deeper understanding of historical mining landscapes and the dynamic role of iron, copper and silver in medieval urbanization and the modernization process.

In this session we will discuss the importance of the distribution of mining and metal production in the landscape in relation to medieval economy and the development of society. We also explore how the industrial development in mines and smelting sites influenced legal organization of the mining area, the coordination of activities in the landscape, such as transports, the relation between agriculture and mining and the network that gave the mining economy such a dynamic power.

Ore, wood and charcoal were moved in local networks to the smelting sites, from which metal was transported on land, water and ice in large scale operations to fortified towns. The long heavy transportations required various special constructions in the landscape and a combination of transfer systems on land and water. Towns were founded where the traders were forced to transship metals from small boats to bigger ships. Protoindustrial establishment required network and complex logistics.

Based on the archaeological material our paper discusses the tacit knowledge and technology involved to manage the logistic sys-

tems and transports in different parts of the landscape. We welcome contributions concerning these aspects of networks.

## ABSTRACTS

### 1 THE IRON PRODUCTION AND THE MODERNIZATION OF SOCIAL RELATIONS IN SWEDEN 1000-1350.

**Abstract author(s):** Lindkvist, Thomas (University of Gothenburg)

**Abstract format:** Oral

The expansion and technological development of metal production in Sweden 1000-1350 had its prerequisites in a medieval modernization process. This social transformation implied particularly urbanization, commodity production, monetarization, wage labor, commercialization and individualization. The metal production was also reciprocally the principal dynamism of this modernization. New social relations and forms of production evolved. The emerging and expanding medieval blast furnace production sites in the Bergslagen area were entirely new forms of production and the social relations of production changed. The older and small-scale bloomery production was integrated within the agrarian economy and its social relation, based upon households and peasant communities. The blast furnace production sites became new social and economic environments, different from the established communities for the agrarian production. The productions sites became i. a. new legal communities with a special legislation. The thrall-dom (or slavery) vanished and was replaced by wage labour. Labour had to be recruited and urban-like settlements emerged. The metal production sites had, due mostly to commercial reasons, a wider network and therefore specific political interests. The metal production districts of Bergslagen became an important political force and a significant military pressure group.

### 2 ANALYSING MINING LANDSCAPES IN SWEDEN

**Abstract author(s):** Magnusson, Gert (Jernkontoret, Stockholm)

**Abstract format:** Oral

The landscape is full of human traces from millennia past, which have been recorded to give us the source material for a deeper knowledge of mining and its history. In Sweden these data are accessible to the general public through the home page of the Swedish National Heritage Board and its database Archaeological Site Information System (ASIS).

The story of how these data were gathered in is part of the history of how modern Sweden evolved. The nation wanted to write its history as a means to justify its existence and claims to its territory. A documentation of rune stones was initiated already in the beginning of the 17th century. During the 18th and 19th centuries, travellers, topographers and artists reported particulars of archaeological remains, mines and smelting houses in various parts of the country. This work began to be more systematised in about 1900 and a nomenclature was formulated.

It was not until 1937, following legislation requiring Sweden to be mapped for the Economic Map, that the step was taken from sporadic local studies to a national and systematic inventory of ancient monuments, including industrial sites. From 1980 to 2003 mining areas were surveyed, sites plotted and remains described. A rich and diverse foundation was laid, which enables us to analyse Sweden's mining landscape history from late Viking period until the 17th century. Today we have a unique register covering over 12 000 mines and 765 smelting sites for iron, copper and silver. In this way our understanding of the earlier mining landscape and its earlier society, its members and the use they made of the landscape can take new dimensions and added depth. It is possible to reconstruct how the whole landscape was organized according to earlier social organisation of labour and ownership.

### 3 MINES AND METALLURGY IN THE CENTRE OF THE IBERIAN PENINSULA: A NEW VIEW FROM THE ARCHAEOLOGY LANDSCAPE

**Abstract author(s):** Berrica, Silvia (Universidad de Alcalá)

**Abstract format:** Oral

The study of several archaeological sites that we have been able to study in the last period has allowed us to distinguish an iron extraction, production and distribution network, during the early medieval period in the Center of the Iberian Peninsula. Thanks to the studies on the landscape, we have also been able to find some interesting data on the regional distribution of iron ingots and so detect the different stages of the handicraft in the field of metallurgy, in different archaeological sites that in the mountainous area localization in the Madrid region (Spain). The study of the landscape through archaeological surveys, the study of emergency excavations, the study of materials chronologically dated thanks to the Harris diagram, and chemical analyses on different materials, will allow us to show and describe an extremely dynamic early medieval landscape. All this is allowing us to differentiate the different social classes that belonged to the early medieval society that managed the mineral resources of these areas, starting from the workers, to the artisans and ending with an elite hierarchical group that was responsible for managing the natural resources of the region and the distribution, showing direct contact also with important urban site or in other rural areas of the region. This work is part of the European landscape debate, which seeks to explain the diachronic evolution of the territory by paying particular attention to the social dynamics that developed within the Early Medieval Period, to be able to shed light on a period that still shows too many uncertainties, especially in this area of the Iberian Peninsula.

### 4

### HOW TO UNDERSTAND MINING LANDSCAPE? MEDIEVAL MINING DISTRICT AS AN ECOSYSTEM

**Abstract author(s):** Cembrzynski, Pawel (Cluster of Excellence ROOTS, Kiel University)

**Abstract format:** Oral

Medieval mining district comprised not only "tangible" aspects such as built environment and natural resources but also social organization, ideas, and knowledge. These material and the non-material structures respectively were highly dynamic. It was a complex network of interacting elements. For this reason, they appear difficult to study as a whole. Thus, the main question is how to study mining districts to get a comprehensive understanding of social and environmental processes in play. To achieve this goal, it is necessary to combine disciplines that study all the aspects mentioned above, i.e. archaeology, history, sociology and environmental studies. However, this interdisciplinary approach brings us to the issue of connecting methodologies of these varying disciplines. In this talk, I would like to present possibilities of looking into mining district in terms of human ecology, i.e. the relation between ecosystem and social system that encompasses and tries to collate studies on both material and non-material elements. Preliminary observations showed that the structure and composition of ore deposit was a crucial element of the ecosystem in the medieval mining district. It was a vital factor for the development of settlement network, technology and supplementary resources required to extract the precious minerals. Fluctuations in quality of deposits triggered changes in the organizational structure of mining which were followed by social changes and growing inequalities. Intensive activities, to maximize the profits, impacted the environment which could bring the district to decay and lower quality of life of its inhabitants. I will present these observations based on examples from medieval Central Europe.

### 5

### MEDIEVAL MINING DISTRICTS IN SWEDEN – THE ESSENTIAL OUTLANDS

**Abstract author(s):** Karlsson, Catarina (Jernkontoret)

**Abstract format:** Oral

For 25 years the project has been compiling and analysing archaeological remains, historic sources, place names and maps in 23 mining districts with medieval origins. Within these mining areas there are archaeological remains from more than 750 medieval furnaces (of which 60% are for iron, 20% copper, 10% silver and 10% with undetermined smelting).

The Swedish mining area Bergslagen is situated north and west of the lake Mälaren. Stockholm, the capitol of Sweden, is located by the rapids, where the lake meets the Baltic Sea. The introduction of industrialized mining has had a crucial bearing on our medieval Scandinavian history and the urbanization of the Mälär areas. Stockholm was founded where the iron and copper was controlled before it was exported from Sweden on the Baltic Sea.

Currently seven historians and archaeologists are working on a synthesis of the results, which will give an overall picture of the medieval metal and mining industry and the mining districts effect on the landscape, economy and social transformation. The interdisciplinary approach in our project provides opportunities of further interpretations and a deeper understanding of the ancient mining landscape and the dynamic role of iron and copper in the modernization process in Sweden 1150–1350 AD.

The source material used in the project are: written documents, laws, charters, tax documents, business agreements, and archaeological remains amounting to 7 000 bloomery sites, 12 000 mines, 760 medieval smelting sites and medieval slag deposits in towns.

The work is coordinated by the historical Committee of Jernkontoret (The Swedish steel producers association) in cooperation with several county boards. The synthesis will present a new and more complex picture of medieval mining in Sweden and its impact on Swedish and European history.

### 6

### GIS ANALYSES AND DISTRIBUTION MAPS OF THE REMAINS OF THE MEDIEVAL SWEDISH METAL AND MINING INDUSTRY

**Abstract author(s):** Berg Nilsson, Lena (ArcMontana)

**Abstract format:** Oral

The project "Atlas of the Swedish mining districts" has for 25 years compiled material from 23 mining districts in Sweden, using archaeological remains, written sources, place names and historic maps. The source material have been associated with geographic objects and – apart from the first few years – collected in several GIS databases, with partly different structure and coordinate system, depending on the period during which the different databases were established.

The ongoing project "Medieval mining districts in Sweden – the essential outland", brings together all the achieved GIS information concerning medieval mining remains into a common database of uniform structure, also including material from the previously not digitalized information of the early years of the project. Based on the new GIS database, both different statistical data and distribution maps concerning the medieval Swedish metal and mining industry can be extracted.

A number of examples of both statistics and maps from the GIS database of the ongoing project will be presented, with information on medieval mining districts, mining areas and furnaces in Sweden, with geographical distribution of, for example, metal type, or methods of mining, both by highlighting results from the project and by showing patterns that were previously more or less overlooked. The information from the project's GIS database thus helps to create a greater understanding of the ancient mining landscape in medieval Sweden.



7

**COALING – REFLECTION ON THE ORGANIZATION OF CHARCOAL PRODUCTION DURING LATE MIDDLE AGES AND EARLY REFORMATORY TIMES IN SWEDEN**

**Abstract author(s):** nilsson, ola (ArcMontana)

**Abstract format:** Oral

Work in the forest and the production of charcoal, has been an extensive part of the metal production, whether copper, iron or silver were manufactured. In general, the techniques of charcoal production, i.e. coaling in pits or charcoal kilns is known. However, the knowledge of the structures in detail, during the middle ages in particular, is inadequate. This also applies on the knowledge of how the charcoal production was organized before the metalworks were established in the 17th century.

The presentation discusses whether coaling may have been a driving force for the establishment of new settlements during the late medieval expansion in the forested parts of the “Bergslagen” area of Sweden, outside the prehistoric and early medieval settlements. In the woodland surrounding these newly established settlements, charcoal kilns were built for the needs of the peasant miners’ furnaces. In some cases, there has been a large amount of charcoal kilns built around these new settlements, and they formed the basis for large-scale charcoal production. The charcoal kilns in the landscape were alternately reused depending on the location of available wood for the charcoal production. This is exemplified by a settlement at Horndal’s ironwork, in the southeast part of Dalecarlia in Sweden, where approx. 100 charcoal kilns are estimated to have existed around the settlement.

8

**A SHIP WRECK FOUND WITH A UNIQUE CARGO-OF OSMUND IRON**

**Abstract author(s):** Hansson, Jim (Swedish National Maritime and Transport Museums)

**Abstract format:** Oral

In December 2017 a ship wreck was found in the Stockholm archipelago. This ship is made with heavy construction details that we usually only see in war ships and the heavy construction indicates that the ship was built with heavy cargo in mind. The wreck is surprisingly intact and has all its cargo still in place. There are a little over 20 barrels visible, mostly containing so called osmund iron. No similar wreck has ever before been found in Swedish waters and only two other wrecks with osmund iron in the hold have ever been found in the Baltic Sea.The date of the ship is based on a three legged pot from 1540 and dendro samples date the oak from the barrels as having been felled sometime between 1539-1553.

The wreck and its cargo is unique and therefore has great potential for future research.

Iron exports was then, and still is, one of Sweden’s most important exports but the knowledge of historic cargo ships, the trade routes and the quality of the iron is almost unknown. This ship is one of the most important finds to date and can tell us much more about how the iron was transported, how export was organized and what kind of ships were constructed for iron cargo. We can also get an idea of how life was lived on board and the wreck gives us a great opportunity to analyse osmund iron itself since we have never encountered such quantities before.

Based on the archaeological surveys this paper discusses the ship wreck, its cargo and the possibilities for further study of the history of the Swedish iron industry through a ship wreck still fully equipped and comparable to a time capsule from 1550.

9

**METALLURGICAL INVESTIGATION OF IRON BARS FROM A SWEDISH 16TH CENTURY SHIP WRECK**

**Abstract author(s):** Helén, Andreas (Dept. of Material Science and Engineering, Royal Institute of Technology) - Hansson, Jim (Sweden Maritime Museum) - Eliasson, Anders (Dept. of Material Science and Engineering, Royal Institute of Technology) - Wärm-länder, Sebastian (Division of Biophysics, Arrhenius Laboratories, Stockholm University)

**Abstract format:** Oral

During the 16th century Sweden was one of the major European exporters of steel and iron. Although the historical records describe the amount of steel and iron that was traded, less is known about the quality of the material, or how it was produced. The wreck of a 16th century cargo ship was recently discovered in the Stockholm archipelago. Among the cargo were several iron bars, in the shape of two-meter-long iron rods as well as smaller bars in the shape of Osmund iron. A few such objects – one iron rod and five Osmund bars - were excavated from the wreck and subjected to metallurgical analysis. The iron rod was found to be made from relatively high-quality iron, low in carbon content but rather slag-free and homogenous. The Osmund bars, on the other hand, were very heterogeneous and displayed carbon levels varying between 0.3 % and 0.9 %. The Osmund bars contained no trace elements (i.e., no Ca, Mn, P, or S), but the iron rod contained some Ca that might have been added during blast furnace production. As these two types of bars represent two different kinds of iron fit for export, this ship wreck and the analysis of its cargo content sheds additional light on the Swedish 16th c. iron export.

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**THE CLIMATE IMPACT ON EUROPEAN NEOLITHIC SOCIETIES DURING THE 8.2-KY BP EVENTS NEAR RIVER BASINS AND LAKES SHORES**

**Theme:** 4. Waterscapes: archaeology and heritage of fresh waters

**Organisers:** Andriiovych, Marta (Institute of Archaeological Sciences, University of Bern) - Demchenko, Olha (Odessa I.I. Mechnikov National University; Institute of Archaeological Sciences, University of Bern) - Hinz, Martin (Institute for Archaeological Sciences, University of Bern)

**Format:** Regular session

The transition from the Early to the Middle Neolithic coincides with the 8.2-ky BP event in some areas of Europe. This climatological event, which lasted between 150 to 400 years, has received considerable interest in various scientific fields, from ecologists, climatologists and geologists to archaeologists and dendrochronologists, due to the major changes it has triggered worldwide.

The 8.2-ky BP event initiated with a rapid decline in the average temperature, which could have a major influence on the Neolithic populations as a whole: from changes in the local cultural, social and economic practices to waves of migration. According to the latest results, there might be a link between climatic and cultural changes during the Early and Middle Neolithic in Europe and the Near East. In addition to the cooling effect, the significant rise in sea levels has mainly affected river systems. The communities living in these areas were therefore under particular adaptation pressure. Also, during that time there is evidence of migration waves of Early Neolithic communities in eastern Europe and at the Mediterranean coasts. The 8.2-ky BP effects might be visible in Neolithic cultures of the Cyprus, Greece, Northern Macedonia, Bulgaria, Ukraine, Poland, Spain territories.

The paleoclimate changes could have reversed the neolithization of Europe, but they triggered innovation and adaptation processes. This is supported by the fact that around the transition from the 6th to 5th millennium BCE several communities started to produce ceramics. They also coincided with the rapid increase in water level in the Mediterranean and Black Seas and generally increased aridity.

For this session, we invite presentations dealing with the specific situation of the waterfront community in the face of the changed climatic situation and possible positive or negative consequences on settlement as well as on the innovative potential.

**ABSTRACTS**

1

**THE CLIMATIC IMPACT ON THE NEOLITHIZATION OF THE NORTHERN VOLGA RIVER BASIN**

**Abstract author(s):** Vybornov, Alexander (Samara State University of Social Sciences and Education) - Kulkova, Marianna (Heren State University of Russia)

**Abstract format:** Oral

In the regions of the Northern Cis-Caspian, steppe and forest-steppe Povolzhye semi-desserts with Artemisia had been spread during Early Neolithic period. According to pollen analysis this situation occurred in results of aridization. The culmination of this event is dated about ca.6200 BC and this is the time of transition to Neolithic period in this region. However, in 80-th years of 20th millennium there were just single radiocarbon dates for the Early Neolithic sites of the Volga river basin. Therefore the chronological frameworks were under discussion. In the last 12 years numerous dates were obtained and now it is possible to reconstruct whole process. The most of radiocarbon dates for Early Neolithic sites of the Northern Cis-Caspian (Kairshak III, Baibek), the Low Povolzhye (Algay, Varfolomeevka), forest-steppe Povolzhye (Chekalino, Vyunovo ozero) are in the range from 6200 to 6000 cal. BC. In this period there were the sites with dwellings, lot of artifacts among which big size vessels had been found also. So, it is questionably that in this time the pick of aridization has occurred here at 6200-6000 BC. Besides, some sites like Kugat, Ivanovka have radiocarbon dates about 6600-6500 BC. The cultural layers on these sites are poor, the stone inventory has a Mesolithic style, the ceramics are not numerous and it has small size. It is important to note the lack of sites dated to 6400-6300 BC. Therefore, it is possible that exactly in this period the pick of aridization occurred. Probably, ceramics appeared in this region before aridization. This period could be the beginning of transition from Mesolithic to Neolithic. It can be suggested that development of this processes was stopped by climatic factors. Part of population migrated in another region. Around 6200 cal BC climate became more favorable and these landscape niches were occupied again.

2

**GYRZHEVE - A COMPLEX ARCHAEOLOGICAL SEQUENCE IN SOUTH-WESTERN UKRAINE ENCOMPASSING THE 8200 CALBP EVENT**

**Abstract author(s):** Lishchyna, Kseniia (Odesa I. I. Mechnikov National University)

**Abstract format:** Oral

The site of Gyrzheve was discover by V.N. Stanko in 1961 and subsequently excavated by him in 1962-1964. It situated on a terrace (some 40 m high) of the river of Kuchurgan. The site contained materials of Late Mesolithic, Para-Neolithic (in local tradition called Neolithic and distinguished by pottery presence) and Chalcolithic periods. A series of radiocarbon dates obtained in Kyiv laboratory recently both on bones and on potsherds. The dates encompass 6500-6200 calBC. Potsherds bear comb imprints and could be attribute to Samchyntsi style of Buh-Dniester pottery. However, the site also yielded a group of trapezes a retouche couvrant that according to N.S. Kotova cannot be date prior to 6000 calBC. Therefore, we need to hypothesize several Para-Neolithic habitations

at the site of Gyrzheve: the first related to early comb-ornamented pottery and the latter resulting in accumulation of trapezes a retouche couvrant. These visits to site separated by 8200calBP event. Probably it resulted in deposition of green deluvial loam on the floor of Para-Neolithic habitation. The further studies are required to understand the utility of the site for local detection of paleosignal of 8200 calBP event.

3 RAPID CLIMATIC EVENTS AND SOCIAL DYNAMICS (8200-4000 CALBP)

**Abstract author(s):** Kiosak, Dmytro (I.I. Mechnikov Odessa National University) - Ivanova, Svitlana (Institute of Archaeology National Academy of Sciences of Ukraine)

**Abstract format:** Oral

The paper treats an issue of radiocarbon dates calibration both for palaeoecological proxies and archaeological sites. This helps the authors to meet the question of correlation of rapid climatic events, Black Sea level changes and revolutionary alterations of the local populations subsistence patterns on the calendar chronological scale in the North-Western Pontic Area. We reconstruct the impact of climate change on human colonization of the Black Sea Steppes. Attention is focused on the three historical situations during rapid climate change: events 8200 cal. BP, 5300 cal. BP and 4200 cal. BP. Regressions and transgressions cannot be placed on the climatic scale with a certainty. The conclusions lay in the field of methodological issues for synchronization quests in prehistory. We are extremely cautious about “migrationists’ reasoning” for explanation of historical change. The very migration is a social phenomenon and cannot be self-explaining if even it has happened. The explanations should be formulated in sociological terms and incorporated into our systemic understanding of past social worlds.

4 MIGRATION OR JUST A «FASHION TREND»? ECOLOGICAL PRECONDITIONS AND PENETRATION PATHS OF IMPRESSO POTTERY INTO THE NORTHERN PONTIC REGION

**Abstract author(s):** Demchenko, Olha (Odesa Ilya.I. Mechnikov National University; University of Bern)

**Abstract format:** Oral

The emergence of new techniques and technologies has always been one of the main issue of discussion in archaeology. Especially in the case of innovations introduced from outside rather than development of the local tradition. Was it the result of migrations or was it just the transmission of «fashion trends»? Were environmental changes the cause of their spread, and if so, which exactly were?

The appearance of comb-ornamented pottery in the Northern Pontic Region has repeatedly been currently subject of research by Ukrainian archaeologists. Recently, increasingly researchers have associated its appearance with the spread of the Impresso Ware. But, despite some clear links between the Azov-Dnieper Neolithic population and Impresso representatives, Ukraine has never been considered by foreign archaeologists as a possible eastern variant of this tradition.

According to radiocarbon dating, in the Northern Pontic Region comb-ornamented pottery appeared in quantities at the beginning of the 6th mill. BC. Around the same time, impresso ware appeared in the European continent (Thessaly, Adriatic, Southeast Balkans etc.). The most likely cause event triggered the spread of early farmers, by different routes out of West Asia and the Near East was climate changes of aridity of 8200 cal BP. Perhaps the population could also move eastward to the Northern Pontic Region (water and/or landway). From this viewpoint, the earliest sites of the Azov-Dnieper culture (Chapaevka, Frontove, Dolynka etc.), which appear in the region just after 8200 BP, are particularly interesting. These fundamentally different from the local Early Neolithic population and don’t have any aboriginal traditions, unlike next periods of existence of Azov-Dnieper society.

We consider the causes and possible penetration paths of Impresso Ware in to the region. Comparison of the materials identifies the weather it was a real migration of an identical population or it was a borrowing of “fashion trend”.

5 THE TRANSFORMATION OF THE NEOLITHIC SOCIAL GROUPS WITH MARIUPOL TYPE CEMETERIES AFTER EVENT 8.2 KY. BP

**Abstract author(s):** Andriiovych, Marta (Institute of Archaeological Sciences, University of Bern) - Hafner, Albert (Institute of Archaeological Sciences, University of Bern) - Shydlovskyi, Pavlo (Taras Shevchenko National University of Kyiv, Ukraine; Center for Paleoethnological Research, Ukraine)

**Abstract format:** Oral

Human groups generally react sensitively to all changes that affect their everyday life.

During the 160-400 year cooling phase about 8’200 years ago, several major environmental changes took place: the increase of water in the ocean and seas; the cooling of the average temperature by ~3.3 +/- 1.1°C; the aridification of the North Africa and the Middle East, to name only the most significant effects. Such changes may have had an impact on the Neolithic populations of the Middle East and Europe.

On the territory of today’s Ukraine, the 8.2 ky BP event coincides with the transition from the Mesolithic and early Neolithic way of life. The late Mesolithic cultures of Donetsk and Kukrek became important transitional groups in the Early Neolithic. And at the same time, Early Neolithic groups already formed, which are called Bug-Dniester, Surska, and Azov-Dnieper cultures. Simultaneously with the cooling, these societies underwent profound changes, which may have been caused by the settlement of new groups in the region. One of the “characteristics” of these new cultural groups is the production of ceramic objects such as pottery.

6 POPULATION DYNAMICS OF THE KYIV DNIEPER REGION AT THE BORDER OF PLEISTOCENE - HOLOCENE

**Abstract author(s):** Shydlovskyi, Pavlo (Taras Shevchenko National University of Kyiv; Center for Paleoethnological Research) - Sorokun, Andrii (Institute of Archaeology, National Academy of Sciences of Ukraine; Bila Tserkva Local History Museum)

**Abstract format:** Oral

It is possible to find out the continuity or discontinuity of the processes during the transitional periods with the involvement of the data of several related disciplines, in this case - the prehistoric archaeology and paleogeography.

Since the beginning of the final Palaeolithic (after 13 ky BP), in the territory of Kyiv Dnieper region there may be a significant decrease in the number of sites culturally associated with the final Epigravettian and the complete absence of monuments dating from 12 to 9 ky BP. The resettlement of this region became possible only on the border of Preboreal and Boreal, after the final formation of the modern Dnieper valley and was connected with the cultural phenomena of Kudlayivka and Janislawice. These processes coincide with the formation of modern river meanders and bends. Neolithisation of the Middle Dnieper region is associated with the distribution of the Kukrek community from the Northern Black Sea area. The testimony of this process is the assemblages of Lazarivka, Krushnyky and Khodosivka with the Kukrek lithic industry and Bugh-Dniester ceramics, dated in the range of 6.9-6.3 ky BP.

Thus, the dramatic changes in the landscape and climatic situation on the border of the Pleistocene - Holocene were undoubtedly a major factor in the process of settling the territory of the Middle Dnieper. The disappearance of the Pleistocene faunal assemblage and the change of the water regime of the rivers significantly affected the demographic situation in the Kyiv Dnieper region. The active settlement of this territory occurs rather gradually during the Mesolithic - Neolithic and was associated with the formation of modern valleys of the Dnieper, Pripyat and Desna on the one hand and migration processes on the other.

436 NOW YOU CAN'T SEE ME! SEARCHING FOR RESILIENCE AS AN ARCHAEOLOGICALLY OBSERVABLE PHENOMENON

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Hinz, Martin - Heitz, Caroline (Institut für Archäologische Wissenschaften, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Laabs, Julian (Institut für Ur- und Frühgeschichte, CAU Kiel) - Kolář, Jan (Department of Vegetation Ecology, Institute of Botany of the Czech Academy of Sciences; Institute of Archaeology and Museology, Faculty of Arts, Masaryk University)

**Format:** Regular session

‘Resilience is the capacity of a social-ecological system to absorb or withstand perturbations and other stressors such that the system remains within the same regime, essentially maintaining its structure and functions’ (Resilience Alliance 2015). This definition implies to conceptualize past communities as socio-ecological systems, calling for (inter-/trans-)disciplinary approaches. Furthermore, the definition poses great challenges for archaeology: Do we have to consider a social entity as resilient if we cannot perceive a significant change in their material remains? Can we assume that resilience is epistemologically the invisible results of the unchanged? But as we know: past communities were always in flux.

Despite the increasing applications of resilience and related concepts in archaeological studies, it is unclear how we can grasp resilience within the framework of (pre-) historical research beyond the pure metaphorical use of the term. So is resilience a meaningful concept stimulating research that can be addressed with our methodological tools? Can we distinguish between situations where communities can buffer external shocks from those where these shocks did not occur, or such where we lack the sources to identify them? How can we meaningfully address questions of contemporaneity with blurred dating in archaeological and palaeoecological investigations? What temporal/spatial scale should we use to identify a change? How can we deduce causality when there is an event on one side and a non-event on the other? How can we deal with the problem of equifinality? And is resilience a gradual or an absolute characteristic of communities?

For this session, we would like to invite contributions that deal with these and related topics from an (inter-/trans-) disciplinary perspective and propose a solution to these questions. These can be theoretical papers discussing concepts of resilience or ‘better’ alternatives or case studies covering examples of resilience or resilience strategies empirically.

ABSTRACTS

1 QUESTIONING CONCEPTS OF COLLAPSE AND RESILIENCE IN PREHISTORIC ARCHAEOLOGY

**Abstract author(s):** Heitz, Caroline - Hinz, Martin (University of Bern, Institute for Archaeological Sciences; University of Bern, Oeschger Center for Climate Change Research)

**Abstract format:** Oral

Archaeology offers the only deep-time perspective for inquiring and understanding the circumstances under which human societies managed or failed to cope with hazards and disasters caused by abrupt climatic changes over shorter and longer periods. Linking climate-mediated environmental changes and transformations in human societies rises first and foremost epistemic questions on concepts used for describing societal conditions and transformations, besides problems and methods of linking data of different proxies and scales to model the mutuality of human-environment relations. In this contribution, we review the analytical capacities

and limitations of the concepts of resilience and collapse to approach past societal transformations. While the topic of societal collapse was introduced to archaeological and anthropological sciences from different directions in the late 1980ies, resilience has been discussed primarily by transferring Adaptive Cycles models to archaeology, that is the core of the Resilience Theory derived from ecology and research on socio-economic systems. The main problems that emerge are determinism and one-sided deduction, as well as the difficulties of transferring such theoretical and methodological frameworks to archaeology, which becomes particularly evident when searching for archaeological indicators to be chosen as model-determining parameters. Instead of operating with poorly adapted terms and concepts in a deductive top-down manner, we proposed an inductive evidence-driven bottom-up approach of correlating and statistical significance testing of archaeological and paleoclimatic data based more on the observations and implemented in the form of a formalized analytical method.

2

## PROXIES, PROXIES, PROXIES. DEFINING PARAMETERS FOR OPERATIONALISING RESILIENCE AND IDENTIFYING SYSTEM TRANSFORMATION IN THE PALAEOLITHIC RECORD

**Abstract author(s):** Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 Scales of Transformation) - Bradtmöller, Marcel (Heinrich Schliemann-Institut für Altertumswissenschaften, Universität Rostock)

**Abstract format:** Oral

According to Resilience theory, resilience is the ability of a system to remain within the same regime i.e. to re-invent itself in times of change. The dimensions, along which this remaining in the same regime is measured, are potential and connectedness. Potential describes the number and kinds of future options available and is accumulated by experienced skills or networks of human relationships. Connectedness is a measure that reflects the degree of flexibility or rigidity of such internal controls. Hence, when aiming to use this concept on archaeological material, we have to identify proxies for potential and connectedness. Furthermore, we have to detect the limits between re-organisation and transformation or leaving into another regime.

Comparing the thus far published applications of resilience theory in the Palaeolithic record, we exemplify the use of different proxies and aim to systematise these in order to approach an operationalisation of the resilience theory concept in hunter-gatherer societies and to strengthen our understanding of transformation processes in the past.

3

## A CLIMATE-INDUCED SETTLEMENT DECLINE AROUND 3400 BCE IN SWISS WETLAND SITES?

**Abstract author(s):** Hinz, Marti - Heitz, Caroline (Institut für Archäologische Wissenschaften, University of Bern) - Laabs, Julian (Institut für Ur- und Frühgeschichte, CAU Kiel)

**Abstract format:** Oral

Interlinking climate fluctuations and social transformations in search of past actors' coping strategies connected to environmental challenges raise first and foremost epistemic questions concerned with. As a result of the identified methodological issues of using Resilience Theory and Adaptive Cycle Models in Prehistoric Archaeology, we will explore an alternative, data-driven inductive bottom-up approach by treating archaeological information and paleoclimatic proxy data with qualitative and quantitative methods of observation and inference. As a case study, we investigate the presumable causal relationship between a climatic deterioration around 3400 BCE and a decline of Neolithic settlements on lakeshores of the northern Alpine Foreland. Well-researched sites in Western Switzerland with complete information on size, development and internal site chronology provide the best examples. Following the current research narrative, mainly rising lake levels following Holocene cold events are seen as a factor for the temporal interruption of settlement activities near lakeshores. During the period around 3400 BCE, intense winter precipitation in cold periods that were followed by warmer ones is seen as a factor for the temporal interruption of Neolithic settlement activities near lakeshores due to rising lake levels. Recurring flooding events which transformed settlement areas for decades into submerged landscapes affected highly mobile agrarian societies severely but not fatally. These populations clearly showed pronounced capabilities to adapt to challenging environmental situations and cope with them. Flood events are proposed here as being the major factor of turning down settlement activities at lakeshores. Their resilience towards these environmental impacts makes the wetland settlements practices in lakes and bogs of the Alpine Space a special example for the resilience of early agrarian societies. Methodologically, we hope to advance beyond pure 'eyeballing' and the superimposition of archaeological and paleoclimatic time series.

4

## CONTINUITY OF HUMAN ACTIVITIES AND RESILIENCE

**Abstract author(s):** Kolar, Jan (Institute of Botany of the Czech Academy of Sciences; Masaryk University) - Macek, Martin (Institute of Botany of the Czech Academy of Sciences; Charles University) - Abrahám, Vojtěch (Charles University; Institute of Botany of the Czech Academy of Sciences) - Tkáč, Peter (Institute of Botany of the Czech Academy of Sciences)

**Abstract format:** Oral

The popular notion of fully settled Neolithic farmers comes from our knowledge of the agricultural life in Europe of the last five centuries. In such socio-ecological system the continuity of a settlement means in most cases continuity of land use and thus a resilient system of the human-environment interactions. Nevertheless, from areas with a precise chronologies based on dendro-chronological or radiocarbon dating we know that the prehistoric communities were much more mobile during the seasonal changes or in yearly cycles. This brings us to several questions? Do the gaps or hiatuses in the settlement mean that the communities were affected by some external factors and they had to change their place of dwelling and land use? Did that mean also a change of their way of life? Does the change really mean that they were less resilient?

The paper will explore possibilities of research into the continuity of settlements in areas which lack detailed chronologies. We will demonstrate use of large-scale databases of archaeological sites and finds covering the whole Czech Republic. Continuity of settlement throughout the prehistory and the Early Medieval Period will be explored with help of quantitative modelling and the results will be discussed from the perspective of the resilience theory.

5

## ASSESSING RESILIENCE IN LONG-TERM URBAN DEVELOPMENT: A CONCEPTUAL RESEARCH DESIGN FOR STUDYING THE ADAPTIVE CAPACITY OF URBAN FORM

**Abstract author(s):** Vis, Benjamin (University of West Bohemia)

**Abstract format:** Oral

The adaptive cycle in Resilience Theory is a useful model for guiding investigative perspectives, but it tends to structure research into demonstrating correlations with developmental phases in the model, often without explicitly querying scale, scope, and time span. Instead, I will develop an argument for concentrating analytical efforts on identifying and understanding what adaptive capacity consists of, based on plans for a research project on regional urban development around Merida (Yucatan, Mexico).

On the dry tropical karst plain of the Merida region urbanism has existed continuously for some 2,500 years. Settlement patterns show apparent consistency and change in the layouts of major centres. Like many cities in the global tropics, Merida is facing severe threats to sustainability as the region continues to urbanise rapidly. Previous social-political research has suggested that in the mid-term, 15th century to present, Yucatan completed two adaptive cycles. Accepting that regional urbanism is characterised by patterns of both continuity and change, it may be a fallacy to question on what scale and scope separate 'urban systems' start and fail. Instead, we could embrace the ever transformative nature of urban development processes to find out how the spatial morphology of urban settlement patterns enabled adaptation to changing conditions, preserving a regional urban way of life. Archaeology can then evidence the spatial morphological properties that support and enable developmental dynamics to improve our understanding of how regional urban life was able to adapt and reinvent itself. Ultimately such analysis may aid current urban development strategies to build or maintain adaptive capacity that is particular to the region.

6

## A MACROEVOLUTIONARY APPROACH FOR MODELLING RESILIENCE IN THE ARCHAEOLOGICAL RECORD

**Abstract author(s):** Gjesfjeld, Erik (University of Cambridge)

**Abstract format:** Oral

Resilience can be broadly defined as the capacity of a system to absorb or withstand disturbances and still maintain its structure and function (Gunderson and Holling 2002). Broadly speaking, the concepts associated with resilience theory offer immense potential to help frame archaeological expectations of long-term cultural stability and transformation. However, operationalising the concept of resilience into archaeological practice has been slow with ongoing debates over terminology, the relevance of the adaptive cycle, and an overemphasis on the stability of systems (Bradtmöller, Grimm, and Riel-Salvatore 2017; Barrios 2016). This research presents a novel framework for modelling resilience in the archaeological record by examining the dynamics of diversification. The approach centres on diversity as it is widely held to be a critical component of resilience in that it provides options for responding to unpredictable changes and disturbances. This work also utilises the long history of modelling diversification dynamics in macroevolution in order to apply a Bayesian framework to estimate long-term trends in the diversity of material culture at continuous time scales (Gjesfjeld et al. 2020). The method presented improves on previous frameworks by disentangling the relative contributions of origination and extinction to diversity and providing robust estimates of key shift points in the diversification history of material culture. Archaeological examples used to demonstrate this approach come from the Puebloan period in the American Southwest and the Late/Final Jomon of Japan. These large datasets are reused from online digital repositories and represent cultural periods of significant social and environmental instability. Ultimately, this research demonstrates that by modelling historical trends in the diversity of archaeological material, we can more aptly monitor cycles or resilience and infer cultural tipping points as well as cycles of growth, conservation, and reorganisation.

7

## MISSION (IM)POSSIBLE? – OPERATIONALIZING (SOCIO-)PSYCHOLOGICAL RESILIENCE FACTORS IN ARCHAEOLOGICAL RESEARCH

**Abstract author(s):** Schreiber, Stefan - Busch, Alexandra (Römisch-Germanisches Zentralmuseum)

**Abstract format:** Oral

The common archaeological meanings of resilience as a capacity of socio-ecological systems tempts us to consider them only on the level of societies and their environment. If the scale is extended, human individuals and groups can also be understood as socio-ecological entities. This makes it possible to integrate psychological and social psychological insights into archaeological resilience research.

Based on the research in our project “Resilience factors in diachronic and intercultural perspectives”, we would therefore like to present an approach that deals with those factors that make human individuals and groups resilient. We would like to understand resilience factors as socio-cultural resources that are strongly correlated with resilience.

Our presentation aims to propose an operationalization of psychologically-proven resilience factors for archaeological research. At the same time, new resilience factors will be proposed, which have not yet been discussed in the context of resilience for human



individuals and groups. These should help us to 1) investigate the respective characteristics of the resilience factors through different times and spaces comparatively, 2) identify possible weak and strong couplings of effective stressors and applied resilience factors, 3) analyse possible long-term developments of resilience factors.

8 HOW RESILIENT IS RESILIENCE? CRITICAL REMARKS ON THE SUSTAINABILITY OF A CONCEPT

**Abstract author(s):** Gronenborn, Detlef (Roemisch-Germanisches Zentralmuseum; Johannes-Gutenberg University Mainz)

**Abstract format:** Oral

Resilience as a concept has its roots in military psychology, from there moving to the social sciences, later to the environmental sciences and, since about 2005, has made its way into archaeological thought.

Since then, and in concurrence with an ever disintegrative (western) world, it has undergone a hype phase, starting about 5 years ago.

The concept of resilience is investigated in archaeological approaches, particularly in studies on early farming societies. But it is also briefly investigated in modern-day contexts, within the globally changing world. Its validity is discussed for both periods and its explanatory value investigated, particularly in relation to the ethical implications of the resilience concept.

In the course of reflections on the validity of the concept and its viability for the nearer future alternatives or rather more concrete aspects are discussed, particularly one aspect which might prove rewarding for further studies, namely social cohesion and its cyclical behaviour.

438 ARCHAEOLOGY AND ITS POLITICAL USES: HISTORICAL, HISTORIOGRAPHIC AND IDEOLOGICAL DISCOURSES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Laszlovsky, József (Central European University) - Varga, Benedek (Hungarian National Museum) - Parvanov, Petar (Central European University)

**Format:** Regular session

Archaeology as an academic field of studies has never been separated from politics and from various ideological influences. The research of the material remains of the past is fundamentally influenced by financial constraints, institutional frameworks and academic discourses. Historiographic approaches connected to the history of archaeology have demonstrated the close relationship between archaeological research and political systems, particularly in the context of nation building processes and under totalitarian regimes. The aim of the session is to go beyond these examples and interpretations, and to offer a broader perspective on different political instrumentalisation processes.

Papers will discuss how particular aspects of human history and their relevant archaeological materials were selected by archaeologist, other scholars, politicians, social movements and governments to support the nation building process in the 19th and 20th century, or in contemporary Europe. Interpretational frameworks range from Siedlungsarchäologie to ethnogenesis, from cultural history to archaeogenetics, and topics are selected to demonstrate the academic side of these relevant scholarly issues. At the same time, political structures, movements and organizations representing empires or processes that led to European integration will be discussed through historical or ideological discourses related to cultural, ethnic and religious differences.

The session invites speakers willing to present historical examples of political instrumentalisation, and ready to discuss the contribution of archaeologists or academic research directions in these processes. Relevant topics include reception history, identity building and community involvement in their historical context. Archaeological sites are often transformed to national memorial places, which are often used for political manifestations. Methodological and theoretical debates within archaeology and in connection to other academic disciplines are also part of the themes to be presented in this session. The historiographic approach is one of the key factors in these discussions, as it is relevant for present archaeological discourses.

ABSTRACTS

1 ARCHAEOLOGY, NATIONAL IDENTITY AND CURRENT INDEPENDENCE IDEAS. ANALYSIS OF PROTOHISTORY OF NORTH OF IBERIAN PENINSULA

**Abstract author(s):** Lerma Guijarro, Alma (Backset Archaeology; Complutense University of Madrid)

**Abstract format:** Oral

Why are the symbols of protohistory used today? What is the feeling that unites the people of the present with the symbols of the past? Is it just a fad or is there a true feeling of ideological union with the civilizations of the past? Who has built these ideas and put them in the minds of the population? What is the role of archeology in all of this?

In this paper I show an analysis of the origin of current national identity in the north of Iberian Peninsula and why it is represented with protohistory symbols.

I analyze the projection of the past to the future as well as those of the future to the past, through the construction of modern

states, their nationalist ideas and the struggle of the independence communities against them.

I deal with Celticism problem and the misrepresentation of history in the wake of nationalist ideas. I take as a case study the communities from Galicia, Basque Country, Catalonia and Asturias.

I report the use of protohistoric symbols associated with cultures of the north of Peninsula in 20th and 21st centuries as an expression of national identity and independence of the Spanish state.

2 GLOBALISATION AND ITS WAKE: CASE STUDIES FROM JAPAN AND ENGLAND AND THEIR IMPORTANCE IN NARRATIVES OF NATIONAL IDENTITY

**Abstract author(s):** Hutcheson, Andrew (University of East Anglia; Sainsbury Institute for the Study of Japanese Arts and Cultures)

**Abstract format:** Oral

At either end of Eurasia there are island nations intellectually and politically struggling with their place in a globalised world, Japan and England. Both nations have significant time-depth and a set of origin myths/narratives associated with perceptions of beginnings. These origin stories were adopted to interpret the archaeological record and to write political discourse. Both countries now have complex relations with a liberal orthodoxy and have political interests in aspects of the past chosen to represent national identity.

This paper looks at two queens historiographically: Himiko and Boudicca and consider their relationship to historical narratives of nationhood. It will comment on how archaeological material has been connected to these figures. Both historical figures are temporally situated at the boundary between archaeological periods: Himiko at the juncture where the Yayoi and Kofun meet, the mid 3rd century CE; and Boudicca between the British Iron Age and the Romano-British period in the mid 1st century CE. The following periods were ones of momentous change with growing influence from imperial continental neighbours possessing very different world views. Archaeologically we can see this influence growing throughout the preceding periods.

Presentation of heritage relating to the above themes incorporates these characters in their narratives. There is some acknowledgement that this relationship is epistemologically problematic. The theoretical basis for writing narratives based on the archaeological record is unstated when those narratives are presented to a public for consumption, either as education, or as leisure. That leaves the heritage consumer with a gap that they may find difficult to interpret. Into that gap there is the potential for political discourse that may be unintentionally facilitated. Do we as archaeologists have a responsibility for the creation of better theoretically informed narratives and what are the political ramifications of insisting on that kind of editorial control?

3 RUSSIAN ARCHAEOLOGY UNDER IDEOLOGICAL STATE CONTROL: THE TAMAN EXPEDITION (1930-1931)

**Abstract author(s):** Zastrozhnova, Evgenia (Archive of Russian Academy of Sciences) - Medvedeva, Maria (Institute of History of Material Culture of RAS)

**Abstract format:** Oral

Russian Academic archaeology in the early of 1930s was at a critical stage for science. Many ancient monuments, whose archaeological excavations were started before the revolution, needed in further investigations. Active industrial construction also began, and archaeological research was required over large areas. However, at this time in the Soviet Union was a tendency to strengthen the ideological control for science from the state. The search for class enemies and suspicions of espionage were particularly noticeable in the scientists who conducted excavations on the border territories, including the coast of the Kerch and Taman peninsulas. In Classic times, the Bosporian Kingdom was situated on this territory, which caused a large concentration of ancient monuments there.

The Taman expedition of GAIMK (State Academy for the History of Material Culture, Leningrad) under the leadership of outstanding Russian archaeologist A.A. Miller carried out large-scale work in 1930-1931. More than 60 ancient hillforts and ancient settlements have been identified and described, some have been excavated, a detailed map has been compiled of all the ancient settlements and burial grounds in Taman. One of the participants of this expedition, G.I. Boroffka was arrested on charges of espionage immediately after his return to Leningrad in 1930, and head of expedition, A. A. Miller, three years later, on charges of membership in an anti-government organization. The results of the expedition were not published.

Until recently, the main sources of information about the progress and work of the expedition remained fragmentary information stored in the Scientific archive of the IHMC RAS. After working with the materials of investigative cases in the Archive of the Federal Security Service, were revealed many previously unknown details about the organization of work and the future fate of archaeologists in this crucial stage for science.

4 HERITAGE INDUSTRY, POST-NATION AND MATERIALITY: AN ARCHAEOLOGY OF ARCHAEOLOGY

**Abstract author(s):** Kulenovic, Igor (University of Zadar)

**Abstract format:** Oral

There is no shortage of archaeological literature discussing various aspects of entanglement between archaeology and the nation. As a matter of fact, the constitution of archaeology as a specifically modernist discursive formation is impossible to imagine outside the wider processes of modernity. The common approach taken in this body of literature is to demonstrate how past-related

discourses were mobilized to achieve various goals ranging from nation-building and claims for authenticity to more extreme examples of territorial claims and extermination of whole populations. In this presentation, I will take a different approach. Rather than concentrating on discursive aspects of uses and abuses of the past, the main focus will be on the very materiality of archaeological remains and how they were mobilized to constitute various subjectivities. Drawing on various strands of more-than-representational theory, I will attempt to demonstrate how archaeology and the affordances of material remains it produces were mobilized in completely different contexts during a span of roughly fifty years. The content of this transformation is that archaeological remains are no longer mobilized to constitute a spatial setting for the constitution of subjectivity based on the modernist liberal consensus but rather now operates in the vague space of heritage industry, oriented almost exclusively towards tourism. The case study used to elaborate on some of these issues will be Zadar, a mid-sized coastal town situated at the Adriatic sea in Croatia.

5 **ARCHAEOLOGY OF ARCHAEOLOGY: HOW TO GET INTO AN ARCHAEOLOGIST’S MIND**

**Abstract author(s):** Korver, Iris - van Wijngaarden, Gert Jan - Gerritsen, Vita (University of Amsterdam) - Montes, Maria Camila (Amsterdam Troy Team) - Manasijev, Bojan (University of Amsterdam)

**Abstract format:** Oral

It is often said that the archaeologist’s views shape an excavation. These views are influenced by different factors such as Zeitgeist, information availability, and social networks. As a result, archaeological practice has been in constant flux since its beginnings. Although the changes in the discipline are frequently addressed in theoretical debates (mostly geared toward major paradigm shifts), the decision-making processes within methodological practice are often not considered. To counterbalance this, a new and innovative project was launched: Archaeology of Archaeology at Troy.

The aim of this project is to understand the role of an archaeologist’s views and methods for the interpretations about a site. Accordingly, we explore the archaeologist’s mind by retracing their thought processes, by studying their excavation diaries, published results, etc. Even the back-filled trenches and dumps are re-excavated. By assessing what was collected and documented and, more crucially, what was thrown away and left out, it is possible to map the mindset of the archaeologist in charge, as well as the historical/political influences they might have been aware of, which shaped the research results on which we now build.

The site of Troy lends itself perfectly for this study, both for its long archaeological history, as well as its position as frontrunner in innovative archaeological practices. From 2018 onwards, we have excavated in dumps and fills of the major archaeological campaigns at the site. In this paper, I will present the case study of a re-excavation in 2019 of a trench originally dug in 1991. It will serve to discuss the methodology behind the project, as well as present some of the project’s preliminary results.

6 **AMONGST FANTASIES FROM MEDIEVAL TIMES UNTIL TODAY: THE SZER ARCHAEOLOGICAL SITE AND HERITAGE COMPLEX AS A CULTURAL AND POLITICAL PHENOMENA**

**Abstract author(s):** Szabó, Dénes (Ópusztaszer National Heritage Park)

**Abstract format:** Oral

The Szer monastical site was a central symbol of 19th century Hungarian nationalism, because a medieval gesta identified the place as the site of the first, 9th century “parliament” of the Hungarian chieftains. In the context of the Austro-Hungarian Empire, the site became the target of not just national, but scholarly interest, intertwined inseparately. Its first excavator, Benedek Göndöcs, was not just an amateur archaeologist, but as cleric became the titular abbot of the already non-existent monastery, and was a politician as well - whose role in the Anti-Judaistic parliamentary debates influenced the reception of his excavations in the contemporary press.

The site later became a memorial place, which after the end of the 1st world war gained revisionist symbolism, but the yearly celebrations served also as demonstration of local power by the Pallavicini family, owners of the site, and quasi-feudal landlords of the area. Szer transformed an important materialization of local identities as well.

How did the political usage of Szer change with 1945., how did the socialist state reinterpret the site and the (invented) traditions surrounding it, by first choosing it as the symbol for the division of latifundiums, later creating an archaeological memorial park and an ethnographical open-air museum nearby the ruins and the excavation field? What role can such an institution, with its complicated past, play in current museology, and how can it navigate between professionalism, being a popular tourist attraction, and the expectations of politics?

7 **THE USES OF ARCHAEOLOGY IN THE HUNGARIAN NATION-BUILDING - THE NARRATIVES OF THE SZÉKESFEHÉRVÁR EXCAVATIONS DURING THE INTERWAR PERIOD**

**Abstract author(s):** Kocsis, Andrea (University of Cambridge)

**Abstract format:** Oral

My paper discovers how the interwar Hungary dealt with the tangible and intangible heritage of the medieval kingdom through the case study of Székesfehérvár. Székesfehérvár was the medieval site of the kings’ enthronement and burials. I conducted discourse analysis on the interwar written and visual sources mentioning the excavation site. My results have shown that during the interwar period there was a strong relationship between the national - political discourses and urban planning at the place of the former Basilica. In the 19th century, this site was a place of debating contrasting national and imperial interpretations. It was rediscovered due

to anniversary of the state-founder king’s death, called the Saint Stephen’s Year which was a propaganda event in 1938 supporting Miklós Horthy governor’s power. The memory of Saint Stephen and the governor’s celebration melted together. Christian and military rituals took place on the site of the former Basilica emphasizing national integration. In the visual narratives, the revisionist themes were obvious and emphasized. My paper introduces the way in which the Governor’s personal cult and the heritage of the medieval Kingdom melted together after the trauma which Treaty of Versailles caused in interwar Hungary. Methodologically, my research is a computational textual analysis conducted on hundreds of newspaper articles.

8 **THE EMERGENCE OF THE KEBAN DAM RESCUE PROJECT (1966-1976): AN EARLY ENCOUNTER OF TURKEY WITH PUBLIC ARCHAEOLOGY**

**Abstract author(s):** Denel, Elif (American Research Institute in Turkey)

**Abstract format:** Oral

Archaeological practice reflects a distinct shift in recent years from essentially object-based to people-based research. The social aspect of past societies has gained emphasis in archaeology conducted by the people for the people. The Keban Dam Rescue Project in essence displays an effort along the lines of what can be identified as a form of public archaeology that emerged already in mid-1960’s in Turkey. An initiative of Middle East Technical University in Ankara, the Project brought together national and international teams to record archaeological, architectural, ethnographic, anthropological and historical information from a wide area in the Upper Euphrates. The rural traditions of this region were rich, complex and deeply rooted in the historical, social and cultural traditions of the land in which they had flourished. This paper will examine this initiative, which was supported largely by public funds and shaped by new approaches of a large number of young scholars. An essential element in nation and identity building during the formation period of the Republic of Turkey, Kemal Atatürk’s reforms highlighted Anatolian archaeology as a scientific and academic field that served to tie multifaceted populations to common roots embedded in the land where they resided. The Keban Dam Rescue Project, however, enabled scholars to examine this politically and socially powerful ideology and determine the social, cultural and historical complexity of landscapes that were expected to be submerged in the waters of this massive dam project. As such, the Rescue Project allowed scholars to recognize the heterogeneous structure of Anatolia in the past as well as in the present contributing to the development of new perspectives into Turkish archaeology.

a.

**BETWEEN EAST AND WEST - THE TWO NATIONALIST MODELS OF INTERPRETING HUNGARIAN ORIGINS**

**Abstract author(s):** Kocsis, Andrea (University of Cambridge)

**Abstract format:** Poster

This poster shows how the archaeological heritage of the middle ages was used to create and maintain two models of nationalism in Hungary in the nineteenth and twentieth centuries and their survival to the present day. Each model had a different emphasis, looking to establish a sense of belonging either to the East or West. The Eastern model focused on the Asian origins of the ancient Hungarian (Magyar) tribes, and highlighted the relations with the so-called Turanist nations, with whom the Hungarians supposed to have a common origin. The leading figure for this model was Attila the Hun, the fifth-century king of the Hunnic Empire. In contrast, the Western model drew a parallel with the imperial models popular in Western Europe. Thus instead of identifying with the pagan equestrian image of the Hungarian, it associated the Hungarian state with the Western Christian kingdoms and empires, and therefore looked to the Christian middle ages for its history. The principal figure for this model was Saint Stephen, the founder of the first Christian Hungarian Kingdom. As Hungary’s relationships with fascist Italy and Germany grew stronger, the Christian Middle Ages became a better heritage reference for the interwar Hungarian state, than the barbarian past, therefore I suggest this is why the planned Attila Jubileum in 1935 was cancelled in favour of the Saint Stephen’s Anniversary in 1938.

441 **WEAVING MOBILITY. MOVEMENT OF PEOPLE, TOOLS, AND TECHNIQUES IN THE TEXTILE ARCHAEOLOGY OF THE ANCIENT MEDITERRANEAN**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Dimova, Bela (British School at Athens) - Quercia, Alessandro (Soprintendenza Archeologia belle arti e paesaggio per la città metropolitana di Torino, Ministero per i beni e le attività culturali e per il turismo) - Meo, Francesco (University of Salento)

**Format:** Regular session

Textile archaeology has in recent years provided new tools for investigating interactions, networks, and mobility in ancient societies. This session invites contributions that consider how the study of tools, raw materials, and techniques for textile production can reveal the movement of people, the circulation of goods, and the exchange of technologies, and ideas in the Mediterranean area.

Textiles are excellent exchange goods, being durable, portable, and highly valuable (both as utilitarian and ‘luxury’ objects). Textile makers also moved across the ancient Mediterranean. Written sources from the Bronze Age onwards document both free and forced mobility of textile workers. Mobility took different forms, such as individuals marrying into another community, families or larger groups moving together to settle somewhere new willingly or as slaves, captives, or refugees fleeing war, environmental crisis, or economic hardship. In the absence of written sources, we cannot be certain how people moved, but archaeological data enable us to analyse the direction, scale, timing, and consequences of mobility.

Tools for weaving and spinning are especially suitable for tracing and analysing networks of movement at a regional scale. In the last

10 years archaeologists have made considerable progress in the study and publication of textile tools and remains of textiles from individual sites. Now the time is ripe to connect the dots and consider these finds in a regional perspective.

We invite papers that chart how specific types of tools, techniques, raw materials, and goods moved within and across regions around the ancient Mediterranean. We strongly encourage synthetic and comparative perspectives, for example establishing regional typologies of tools, tracing the chronology and spread of specific shapes and techniques, and investigating the human activities that underpin distribution maps.

ABSTRACTS

- 1

**MID-5TH MILLENNIUM BCE NORTH-SOUTH MIGRATIONS: A TEXTILE FLORESCENCE IN THE SOUTHERN LEVANT**

**Abstract author(s):** Levy, Janet (Ben Gurion University of the Negev)

**Abstract format:** Oral

Major cultural transformations characterize the southern Levant during the second half of the 5th millennium: settlement pattern, mortuary and ritual practices, iconography and symbolic expression, innovative technologies and craft production. It was long suspected that this cultural florescence, particularly the emergence of a fully-fledged copper industry lacking a formative phase, was engendered by a population movement. Recent DNA analysis of the Peqi'in burial cave, featuring ca. 600 individuals in ceramic ossuaries, attests to a genetic admix, both males and females, of 18% of Iranian origin and 26% of Anatolian origin. The genetic profile differs from the Neolithic which precedes it and the Bronze Age subsequent to it and also the coeval cultures of the northern Levant. The migrant population introduced the mechanized loom with heddle technology. Evidence for woven cloth, albeit minimal, is attested in Anatolia and Iran from ca. 6000 BCE. Loom technology was grafted onto long-established, 8th-7th millennium fabric traditions in looping, twining and knotted netting. Skilled hands adopted the technology and it flourished.

A fresco from Teleilat Ghassul, from a stratum dated to 4300 BCE features ritual specialists wearing gowns of woven cloth. Linen textiles, from the same time bracket, are attested throughout the Judean Desert in both domestic and mortuary contexts. Some are of unprecedented dimensions and others with high thread counts. Large spindle whorl assemblages and also a spinning bowl, an artifact type synonymous with high-grade linen yarn, were recovered from sites along the Beersheba valley interface with the Negev Desert. Flax was not cultivated there: it has high water requirements. Flax was cultivated in the Jordan Valley or the Galilee. The sites also feature installations for copper processing from alloys of local ore obtained through barter with pastoral nomads of the marginal zones and ores provenanced to Anatolia-Caucasia: the two aspects are apparently interrelated.
- 2

**TRAVELLING PATTERNS: THE ROLE OF TEXTILE DECORATION IN TRACING MOBILITY OF PEOPLE AND IDEAS IN THE PREHISTORIC AEGEAN**

**Abstract author(s):** Sarri, Kalliope (Centre for Textile Research - CTR, Saxo Institute)

**Abstract format:** Oral

The decoration of artworks and objects of everyday life is one of the most crucial elements that characterize every period being at the same time a valuable tool for identifying cultural heritage and diversity. As a key element of the typological method, decoration has long been one of the main criteria for monitoring cultural phenomena, population movements and for the chronological classification of archaeological finds.

Textile decoration, in particular, is a special case as beside following the general ornamental trend of each era by using a standard decorative programme (i.e. specific syntax, patterns and colouring schemes), it displays a great emphasis on local features. This trait is due to the use of indigenous raw materials, traditional technologies of small-scale communities within limited geographical areas but also to the free imagination and creativity of local craftspeople who accelerated the pace of decorative development.

For these reasons and in contrast to the study of weaving technologies, which seem far identical within larger areas, the study of textile design gives us higher precision in determining the origin and movement of fabrics and the diffusion of style in adjacent and remote areas from their original creation. That is to say; it uses a far more sensitive indicator of cultural spread and the movement of individuals and population groups.

The presentation discusses characteristic examples from the repertoire of textile iconography, focusing on the Aegean Neolithic and Bronze Age periods, showing the dynamics of textile decoration in detecting the locality and mobility of people and ideas.
- 3

**SPINNING AROUND: THOUGHTS ON THE MOBILITY OF SPINNERS IN THE PREHISTORIC AEGEAN**

**Abstract author(s):** Vakirtzi, Sophia (Archaeological Resources Fund Hellenic Ministry of Culture)

**Abstract format:** Oral

It has been well established that in the Aegean Bronze Age, weavers were often mobile artisans who transferred their technology along their journeys to their new homelands. The argument is based both on textual evidence, such as the Mycenaean catalogs of weavers including “foreign” women, and on the analysis of ceramic loom weights, whose typologies and clay fabrics sometimes indicate origins different than the localities where they have been found. For periods earlier than the 15th century BC, textile tools

comprise our only insight into the mobility of weavers in the Aegean, due to a lack of deciphered written testimonies.

What about the spinners? In as much as a rigid division of labor between the two distinct stages of textile manufacture holds for cultural contexts outside the “palatial” textile industries, or periods earlier than the second half of the 2nd millennium BC, the mobility of thread makers could be a different story. Spindle whorls, the remains of the tools used to spin yarn, can offer unique insights to this matter. Morphological variation and macroscopic examination of the clay fabrics of ceramic spindle whorls are in this case, as well, the criteria for evaluating local versus exogenous manufacture of the tools, and may provide evidence for their geographical and / or their cultural transfer. A survey of selected prehistoric spindle whorl assemblages from Aegean contexts will be evoked in this communication to discuss the mobility of spinners in the region, but also to examine the compatibility of mobility patterns provided by spindle whorls as opposed to those provided by loom weights, in several sub-periods of the Aegean prehistory.

- 4

**WHO WAS WEAVING IN THE PREHISTORIC SETTLEMENT OF KOUKONISI (LEMNOS)? PEOPLE, TOOLS AND TECHNIQUES**

**Abstract author(s):** Boloti, Tina (Academy of Athens)

**Abstract format:** Oral

The densely occupied Bronze Age settlement on the Koukonisi islet (in the innermost part of Moudros bay on Lemnos) was excavated under the direction of Chr. Boulotis and the auspices of the Academy of Athens, from 1994 to 2016 with intermissions. Although the site provides an undisturbed sequence from the Early Bronze Age to the early Late Bronze Age, with sporadic finds of the early Mycenaean period (LH II-LH III A1) and a substantial phase of occupation corresponding to the developed Late Bronze Age (LH III A2 - LH III B periods), loom weights begin to appear only in the advanced or the close of the Middle Bronze Age. This “late” introduction of the warp-weighted loom on Koukonisi, considered as a distant echo of Wiener’s ‘Versailles effect’, within the wider context of the so-called “Minoanisation”, suggests that “either individuals learned the weaving skills associated with warp-weighted loom technology while residing for an extended period of time elsewhere, or that skilled craftspeople trained in Cretan techniques were resident for extended periods in the settlement”. In this paper, I aim at discussing what the situation in Koukonisi was from the mid-3rd millennium B.C. onwards: Who was weaving in the settlement and which techniques were used prior to the adoption of the warp-weighted loom? In any case, the process suggests a degree of human mobility within the Aegean during the Bronze Age, and indicates way (-s) in which weaving technology may have been transmitted.
- 5

**MORE ABOUT THE TECHNICAL USES OF TEXTILES – COMPARING TEXTILE IMPRINTS FROM BRONZE AGE LERNA, MAINLAND GREECE, AND PHAISTOS, CRETE**

**Abstract author(s):** Ulanowska, Agata (Institute of Archaeology, University of Warsaw)

**Abstract format:** Oral

A remarkable collection of casts of textile imprints from the Bronze Age Aegean is stored in the Corpus der minoischen und mykenischen Siegel (CMS) in Heidelberg. It comprises impressions of threads, cords and fabrics that were occasionally imprinted on objects subjected to direct and indirect sealing practices. In direct sealing practices, objects such as pots, chests, baskets or doors, were secured by a lump of clay impressed with a seal. In indirect sealing practices, threads and cords were used to wrap seal-impressed objects (e.g. small packets of parchment) or to support hanging clay nodules. Similar sealing practices and, therefore, similar technical uses of textiles were attested at several, geochronologically distant sites in BA Greece. Technical parameters of textile impressions from the casts stored in the CMS Archive are being documented and investigated as part of the research project ‘Textiles and Seals. Relations between Textile Production and Seal and Sealing Practices in Bronze Age Greece’.

This paper examines the evidence for the technical uses of textiles deriving from textile imprints on the undersides of direct object sealings recovered from Lerna in the Argolid (Early Bronze Age) and Phaistos on Crete (Middle Bronze Age). Parameters and production techniques of threads, cords, ropes and textiles that may be revealed from textile imprints, as well as specific uses of textile products in sealing practices as a means to handle, tie, wrap, or store etc., are compared at these two individual sites. The evidence under discussion enables, for what may be the very first time, a quantitative studies of site-specific properties and uses of textile products from Bronze Age Greece.
- 6

**MOVEMENT OF PEOPLE AND NETWORKS OF CRAFTSPEOPLE: SHAPING COMMON TEXTILE TRADITIONS IN ANCIENT SICILY**

**Abstract author(s):** Longhitano, Gabriella (University of Catania)

**Abstract format:** Oral

In ancient Sicily, mobility and cultural interaction have been traditionally investigated through the study of pottery, social practices, domestic and funerary architecture. Only recently, have archaeologists started expanding the investigation to different aspects of material culture and there has been a new focus on textile tools.

This paper will offer the opportunity for a discussion on ancient mobility in Sicily by presenting two case studies of wide distributions of particular textile tools: a distinctive type of loom weights was widespread among different communities in western Sicily during the Archaic period; a common spinning tool tradition was shared by different communities between Sicily and southern Italy.

This paper will attempt to demonstrate that networks of people and craftspeople were instrumental in the transfer of textile tech-



nology as well as in shaping cultural identity. More interestingly, in the case of the loom weights from western Sicily, a particular textile production associated with these loom weights might have been the reason for the movement of weavers, who played an active role as social and economic agents.

444 14C: THE CLOCK READING THE PAST AND PRESENT OF THE HUMANKIND

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Jull, Timothy (Institute for Nuclear Research; University of Arizona) - Hajdas, Irka (ETH ZUirch)

**Format:** Regular session

The introduction of radiocarbon dating method in the second half the 20th Century revolutionized archeology. Ever since the first absolute radiocarbon ages were created for archeological contexts, the method remains a commonly used tool applied by archeologists. The technical developments that took place during the last seven decades opened the field to new materials and new applications. Moreover, the technical and methodological improvements also showed the complexity of radiocarbon dating. We also address the many recent technical improvements to the methods, including reduction in sample sizes, automation and the wider availability of smaller devices. These changes have made it easier to date very small samples, including specific compounds, but at the same time, raise new questions about association of material with the events of interest. We invite archaeologists with questions about these methods, as well as experts to contribute. In this session we would like to address the many diverse aspects of radiocarbon dating applied to archeological samples such as removal of contamination, samples size and new developments in the calibration of the radiocarbon time-scale.

ABSTRACTS

1 RADIOCARBON DATING: A KEY CHRONOMETER FOR ARCHAEOLOGY AND CORRELATION WITH ENVIRONMENTAL CHANGE

**Abstract author(s):** Jull, Timothy (Institute for Nuclear Research, Debrecen; University of Arizona Geosciences) - Molnar, Mihaly - Varga, Tamas - Major, Istvan (Institute for Nuclear Research, Debrecen) - Hajdas, Irka (Laboratory of Ion Beam Physics, ETH-Zurich)

**Abstract format:** Oral

Radiocarbon dating has provided an important role in understanding archaeological chronologies. 14C has a half-life of 5,730 years is produced by the action of secondary cosmic rays on the Earth's atmosphere. Although there is variability in this record, it has been cross-referenced against tree-ring and other proxy chronologies which allowed the generation of an international radiocarbon calibration (IntCal). This record allows us to cover approximately the last 50,000 years of human history. When combined with other information, whether as part of an archaeological or sedimentological sequence, we can learn more about the sequence of human development. We show some examples where radiocarbon has been of great importance to the understanding of the chronology in archaeology and dating of artifacts. Miyake et al. (2012) were the first to show that there are rapid annual variations in 14C as observed in tree rings. Development of an annual 14C vs. dendrochronological record can define cosmic-ray changes and connections to other environmental factors. This additional structure to the 2020 14C IntCal calibration curve can be used to define more precise dating for archaeological material, where these excursions are observed.

2 TEPE SADEGH'S TIME-SCALE, A BRONZE AGE SETTLEMENT IN SOUTHEAST IRAN

**Abstract author(s):** Ebrahimiabareghi, Setareh (University of Bern, Institute of Archaeological Science, Prehistory Department) - Hafner, Albert (University of Bern Institute of Archaeological Science, Prehistory Department; Oeschger Centre for Climate Change Research - OCCR - Research Group) - Shirazi, Rouhollah (Center for Archaeological Research; Archaeology Department, Sistan & Baluchestan University)

**Abstract format:** Oral

Sistan, in Southeast Iran, has been a suitable place of human residence due to Hirmand River. The environmental advantages did foster the prosperity and glory the Sistan region showed during different periods. Archaeological excavations in this area show that this area had been residential especially in the 3rd millennium BCE.

The ancient settlement of Shahr-i-sokhta is one of the most important historical sites in Sistan and has been settled from the 4th and 3rd millennium BCE. Research so far has been focused on the site of Shahr-i-sokhta and only a few attentions are paid to the surrounding orbital settlements in its hinterland and their function in an integrated settlement system. The number of orbital sites of Shahr-i-sokhta increased and extended with the population, in addition there is evidence of specialization and prosperity of Shahr-i-sokhta due to commercial exchanges with surrounding areas. The role of orbital sites regarding this site as pottery producers became more important. Tepe Sadegh is one of the orbital sites of Shahr-i Sokhta, in 13 KM southwest of Shahr-i-sokhta. Pottery is the main object of Tepe Sadegh, Therefore, special attention is given to the analysis of different types of local and foreign ceramic assemblages found at Tepe Sadegh. The typology of the ceramics allows establishing a relative chronology based on the shape and the style of ceramic vessels. This relative site chronology serves for comparisons with ceramic assemblages from Shahr-e-Sokhte. In order to control the results obtained by relative chronology an absolute dating of organic material from stratigraphic layers will be effected (AMS radiocarbon dating). In this research, I will present the difficulties between relative chronology and absolute dating in

Tepe Sadegh and the difference between them.

3 DATING AND MEASURING STABLE ISOTOPES FROM SEEDS OF NEOLITHIC SITES IN THE NW MEDITERRANEAN AND SWITZERLAND TO UNDERSTAND CROP DYNAMICS

**Abstract author(s):** Martínez-Grau, Héctor - Soteras, Raúl (IPNA - University of Basel) - Hajdas, Irka (Laboratory of Ion Beam Physics, Eidgenössisch Technische Hochschule Zürich) - Bernasconi, Stefano - Jaggi, Madalina (Department of Earth Sciences, ETH Zürich) - Caracuta, Valentina (Equipe Dynamique de la biodiversité, anthropo-écologie - DBA, UMR 5554 – CNRS – Université de Montpellier, Istitut des Sciences de l'Évolution de Montpellier) - Antolín, Ferran (IPNA - University of Basel)

**Abstract format:** Oral

The AgriChange project, funded by the Swiss National Science Foundation (SNSF), is focused on the agricultural practices of the communities of NW Mediterranean and Switzerland areas from ca. 6000-2300 cal BC. In this framework, we are generating a large dataset of radiocarbon (14C) and stable isotope ( $\delta^{13}C$  and  $\delta^{15}N$ ) measurements on domestic seeds, mainly cereals. When possible, all measurements are obtained from the same grain. These analyses are carried out at the AMS facility of the Laboratory of Ion Beam Physics and the Department of Earth Science, ETH Zurich.

The vast majority of measurements is undertaken on charred cereal grains, with different degree of preservation and thus they might vary in carbon content after the Acid Base Acid pre-treatment processes applied to remove potential contamination.

Thus, here we present our first experiences in measuring different crop types. In our presentation we will answer following questions: How many of samples were successfully analysed? How was the cleaning process effecting the sample? Was this dependant on species, original weight or size of the grain? How often was there enough material to do all measurements on the same sample?

4 COMPOUND-SPECIFIC RADIOCARBON DATING OF PROTEINACEOUS SAMPLES USING NINHYDRIN

**Abstract author(s):** Meadows, John (Leibniz-Laboratory for Radiometric Dating and Stable Isotope Research, Kiel University; Centre for Baltic and Scandinavian Archaeology - ZBSA) - Hamann, Christian (Leibniz-Laboratory for Radiometric Dating and Stable Isotope Research, Kiel University) - Fernandes, Ricardo (Max Planck Institute for the Science of Human History, Jena) - Rinne, Christoph - Drummer, Clara (Institute of Pre- and Protohistoric Archaeology, Kiel University) - Nerlich, Andreas (Institute of Pathology, Academic Clinic Munich-Bogenhausen, University Munich)

**Abstract format:** Oral

Common radiocarbon pretreatment methods occasionally fail to remove contaminants adequately. An obvious solution is to target more specific chemical compounds. For bone collagen, now the most common archaeological sample type, different methods have been developed to isolate carbon from amino acids, the building blocks of collagen and any other protein. The preferred approach today is to separate and collect individual amino acids using high-performance liquid chromatography (Fernandes et al. 2017 DOI: 10.1016/j.jchromb.2017.05.017), but purification by cross-flow nanofiltration (Boudin et al. 2017 DOI: 10.1017/RDC.2017.137, Boudin et al. 2013 DOI: 10.1016/J.NIMB.2012.08.049) and using ninhydrin to extract carbon from carboxylic groups of amino acids (Nelson 1991 DOI: 10.1126/science.1990430, Tisnérat-Laborde et al. 2016 DOI: 10.1017/S003382220003277X; Dumoulin et al. 2017 DOI: 10.1017/RDC.2017.132) have also been proposed.

We present a novel ninhydrin-based protocol, applicable not only to collagen, but also to any other proteinaceous material, e.g. hair, fingernail, horn, leather, and flesh, making it more versatile than HPLC. The method is also easier to implement than other amino acid specific methods, without the need for special laboratory equipment, and requires smaller samples.

We use this method to date non-bone proteinaceous samples and bones consolidated for conservation. We also test whether differences in radiocarbon ages between bulk collagen and carboxylic carbon can be expected in omnivores subject to dietary reservoir effects.

5 COMPARISON OF TWO PREPARATION METHOD FOR RADIOCARBON DATING OF BONES AT HEKAL

**Abstract author(s):** Major, Istvan (ATOMKI, ICER) - Jull, Timothy (University of Arizona Geosciences) - Molnar, Mihaly (ATOMKI, ICER)

**Abstract format:** Oral

At HEKAL, all bone samples containing collagen are processed according to our modified Longin protocol. At the beginning, all samples are visually inspected and chemical pre-treated using an acid-bas-acid (ABA) protocol. At the end of the chemical pre-treatment, the collagen obtained is gelatinized and freeze-dried. Unfortunately, sometimes, this protocol is not adequate to gain correct dates due to the massive contamination of the bone. In these cases an extra filtering (ultrafiltration) step can be applied to get rid of the extraneous carbon. Regarding the use of ultrafiltration, numerous aspects of its benefits and drawbacks have been presented and discussed in the literature but every researcher agree that the filters need pre-cleaning before using. During the past couple of years, we have had numerous bone samples of different preservation which were processed using our modified Longin and a new ultrafiltration method. Now, the main purpose of this study is to compare and evaluate these methods at our laboratory. The research was supported by the European Union and the State of Hungary, co-financed by the European Regional Development Fund in the project of GINOP-2.3.2-15-2016-00009 "ICER".

a. **MATERIAL CONSERVATION AND RADIOCARBON DATING**  
**Abstract author(s):** Hajdas, Irka (Laboratory of Ion Beam Physics, ETH Zurich)  
**Abstract format:** Poster  
The use of the radiocarbon method to date objects of cultural heritage is a common practice in archaeology, art history and history. However, many of those objects are preserved to prevent their degradation. Such conservation treatments are not always well documented and pose a potential obstacle to accurate dating of the material. The resulting offsets in radiocarbon ages cannot always be detected, especially when no information on expected ages and /or alternative dating is available. Most of the conservation materials produced in the 20th and 21st centuries are based on fossil carbon therefore they include 14C free component. The problem of an unknown treatment history is the following: the spectrum of conservation materials is wide at the same time the treatment of radiocarbon samples is standardized. The contaminants can only be detected using additional analysis such as infrared spectroscopy od gas chromatography (FTIR, Py-GS-MS) allowing for a more specific treatment, designed to remove the detected contaminants. Examples of various problematic cases and treatments applied to wood, bones, and textiles will be presented.

b. **NEW DATA ON THE CHRONOLOGY OF EARLY AND MIDDLE BRONZE AGE IN WESTERN HUNGARY**  
**Abstract author(s):** Melis, Eszter (Castle Headquarters Integrated Regional Development Centre Ltd.; Institute of Archaeology, Research Centre for the Humanities)  
**Abstract format:** Poster  
Currently very little reliable data is available to re-establish an absolute chronology for the Bronze Age in the Carpathian Basin. Western Hungary has a key role from this point of view, since it is considered the gateway to the Carpathian Basin and towards the western territories of Central Europe. However, the archaeology of the region has largely been neglected by Hungarian Bronze Age research until recently, till 2015 only few C14 data were published from this region. Thanks to the Momentum Mobility Research Project the first thousand year of the Bronze Age in Western Hungary have been involved in the multidisciplinary research. Due to the cooperation with the Hertelendi Laboratory of Environmental Studies, Institute for Nuclear Research of the Hungarian Academy of Sciences we had the oppurtunity to date samples mainly from burials with AMS method. As a part of the basic research we have also dated calcined bone samples from cremation burials. In this paper, I shall attempt to sketch out the absolute chronology of Western Hungary between 2100/2000–1500/ 1400 cal BC based on nearly 50, mostly unpublished radiocarbon dates from several sites.

445 **MULTIDISCIPLINARY APPROACHES TO IDENTIFY AND PRESERVE FIBRES AND TEXTILE PRODUCTS IN THE ARCHAEOLOGICAL FIELD**  
**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Organisers:** Coletti, Francesca (Ruprecht Karl University of Heidelberg, Institut für Klassische Archäologie; Sapienza University of Rome, Department of Classics) - Forte, Vanessa (Sapienza University, Laboratory of Technological and Functional Analyses of Prehistoric Artefacts) - Margariti, Christina (Applied Research Department, Directorate of Conservation, Hellenistic Ministry of Culture) - Spantidaki, Stella (ARTEX - the Hellenic Centre for Research and Conservation of Archaeological Textiles)  
**Format:** Regular session  
Fibre identification is a key element in ancient textile studies but surprisingly, yet not thoroughly explored.  
The study of the nature and provenance of archaeological fibres is extremely important in understanding a large variety of economic and social aspects of human societies dealing with the selection and processing of natural resources on a small and larger scale and the kind of expertise required in each step of the textile production process. In order to reconstruct these aspects, a pivotal role is played by scientific analyses to support wider interpretative models. Nevertheless, archaeological textiles and fibre remains are usually rare finds in excavation contexts, and are mainly preserved in specific environmental conditions, since they are generally made of organic material, which is sensitive to the aggressive post depositional processes. There are cases where certain environmental conditions, such as the proximity of textiles to metals, carbonization and waterlogged environments, considerably decelerate deterioration. However, these conditions might also greatly affect the morphology and physico-chemical properties of textile fibres, which are the main features leading to their identification. Prolific work has been done in the past but very often with inconclusive results mainly due to the rarity and poor condition of the finds, and also the immense variety of fibre producing plants and animals used locally since antiquity. Currently, comprehensive studies on more traditional fibre identification techniques, such as Scanning Electron and Optical microscopy, spectroscopic techniques (e.g. IR, Raman) and recent advances in αDNA and paleoproteomics, along with experiments on artificial ageing and deterioration of textiles, constitute a promising path down the exploration and analysis of archaeological textiles.  
This session aims to bring together scholars investigating fibres as evidence of textile activity for their identification and preservation in order to improve the current methodological approaches in the study and conservation of textiles and related material.

ABSTRACTS

1 **EARLY MYCENAEAN CLOTH FROM TOMB 10 AT ANCIENT ELEON IN BOEOTIA**  
**Abstract author(s):** Dimova, Bela (British School at Athens) - Burke, Brendan (University of Victoria)  
**Abstract format:** Oral  
Since 2015, the Greek-Canadian Eastern Boeotia Archaeological Project (EBAP) has been excavating an early Mycenaean burial enclosure, called the Blue Stone Structure. Within this construction, at least 15 rock-lined tombs for multiple individuals have been located. All recovered material from the BSS dates to the late Middle Helladic and early Late Helladic periods (ca. 17th c. BCE).  
About 40 fragments of textile were recovered from Tomb 10, excavated in 2018. The tomb contained the remains of two adults that were pushed to the side with the last interment, the burial of a 10-year-old child in crouched position. The textile was probably laid under the child for the burial. The remarkable preservation is due to the tomb being capped by a monolithic stone slab and sealed with watertight clay.  
Although the textile is fragmentary, very fragile, and heavily calcified from the soil, the uniform appearance of the warp and weft suggests that the fragments belong to a single textile, a weft-faced tabby. Also observed are holes that probably mark places where decorative yarn was inserted as supplementary weft or embroidery. Not only is the structure of the textile remarkable, a series of characteristics identify the single z-spun threads as animal fibre, among the earliest known examples of preserved wool in the Aegean. This paper presents a discussion of the textile and the fibre identification.

2 **FROM SILK TAFFETA TO CLOTHING’S TAILORING: HOW TO DRESS THE DECEASED IN MONGOLIAN ALTAI (BURGAST) IN A 2ND C. AD?**  
**Abstract author(s):** Saunier, Isaline (Ecole Pratique des Hautes Etudes - ED 472 / GSRL / UMR 8582 / PSL université) - Bernard, Vincent (Centre de Recherche en Archéologie, Archéosciences, Histoire - CRéAAH UMR 6566, Univ. Rennes 1) - Cervel, Mathilde (Archéologie et Philologie d’Orient et d’Occident - AOROC, UMR 8546 - CNRS/PSL université) - Joly, Dominique (Archaeology Department of the City of Chartres) - Noost, Bayarkhuu - Tsagaan, Turbat (Institute of Archaeology, Mongolian Academy of Sciences) - Zazzo, Antoine - Lepetz, Sébastien (Archéozoologie, Archéobotanique : sociétés, pratiques et environnements - AASPE, Muséum national d’histoire naturelle, CNRS, CP 56)  
**Abstract format:** Oral  
The analysis of archaeological textiles is a primary source for past societies’ knowledge and the information it provides is very diverse. However, special preservation conditions are needed to obtain a fairly accurate picture of the use of textiles, particularly in the making of clothing. A well example is the case of a 2nd century tomb excavated in Mongolia (Burgast site, Bayan-Ulgii aimag, Altai province) by members of the French archaeological mission in Mongolia and the Institute of History and Archaeology in 2016. This tomb has yielded exceptionally well preserved clothing and typologically complete, which makes it possible to study its characteristics precisely (fibres used, weaving practised, patterns followed). The study of these textile contributes to the description of the Hun-Sarmate culture and this paper will examine several hypotheses both on the origin of the raw material used, silk taffeta, and on the role of these garments: everyday clothing or specially made for funerals? From the analysis of fibres to a general understanding of the deceased’s clothing, the study of Burgast’s clothing, compared to other textiles found in tombs that are chronologically and geographically close, allows us to discuss about textile reuse, clothing design, know-how and gestures around the way of dressing of the deceased during burial.

3 **THE EFFECTS OF CARBONISATION TO THE MORPHOLOGY OF TEXTILE FIBRES. COMPARISON BETWEEN MODERN AND ANCIENT MATERIALS: THE EXAMPLE OF POMPEII**  
**Abstract author(s):** Coletti, Francesca (Sapienza University - University of Heidelberg) - Margariti, Christina (Applied Research Department /Directorate of Conservation at Hellenistic Ministry of Culture) - Spantidaki, Stella (ARTEX, The Hellenic Centre for Research and Conservation of Archaeological Textiles)  
**Abstract format:** Oral  
The aim of this research was to study the effects of carbonisation on the morphology and dimensions of textile fibres. Carbonised fibres from Pompeii excavations were analysed with Optical and Scanning Electron Microscopy (SEM) and compared to a set of standard test, cellulosic and proteinaceous, fabrics, artificially carbonised. Textile finds from Pompeii, of both cellulosic and proteinaceous nature, were preserved as a result of the high temperatures developed by the volcanic eruptions. The carbonisation process that the fibres underwent could be attributed to the combination of extreme heat with anaerobic conditions.  
Experimentally, textile swatches were carbonised in a limited oxygen environment at 250, 350 and 500°C for one hour respectively. Although both cellulosic and proteinaceous textiles had survived in the volcanic eruptions, the wool and silk swatches were destroyed at temperatures above 250°C. Below that temperature wool fibres swell, whereas silk shrunk. Similarly, the fibre diameters of the cellulosic fibres shrunk gradually at different degrees as the temperature increased. Examination of the Pompeian finds showed that bast fibres acquired very small diameters: min. 6 µm and a max. 19 µm. Conversely, the wool fibres seemed to melt and merge every two or more fibres creating a net-like structure and the generalised loss of the scales. The fibres on the artificially carbonised swatches exhibited marked degradation patterns, such as lacerations in flax, ridges in hemp, raggedness in nettle, and



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cracks in silk fibres. Wool fibres swell locally but retained their scales. Exceptionally, the Pompeii wool fibres developed a hollow channel running longitudinally inside, the so called microtube.

The above study showed that carbonisation has marked effects on the dimensions of fibres, however, the morphology of the fibres characteristic to their identification does not alter to an unrecognisable degree, as long as the material is preserved.

### IDENTIFICATION OF SILKS BY PROTEIN MASS SPECTROMETRY

**Abstract author(s):** Lee, Boyoung (University of Oxford; Smithsonian Museum Conservation Institute) - Pires, Elisabete (University of Oxford) - Solazzo, Caroline (Smithsonian Museum Conservation Institute) - Pollard, Mark - Mccullagh, James (University of Oxford)

**Abstract format:** Oral

Bombyx mori is the only completely domesticated species that is commonly known as Chinese silk. There are also a variety of wild silk (non- or semi-domesticated) species of Saturniidae family, which have been commercially exploited in Asia and Africa from ancient times, prior to the introduction of domesticated silk. [1] The identification of silks from the archaeological sources has been a controversial subject, [2] largely owing to the limitations in conventional methods of fibre analysis that cannot accommodate species-level identification of protein fibres. The techniques of proteomics could elucidate this matter, as it has been already adopted in the analysis of archaeological fibres of mammalian origin. [3] However, due to the difficult nature of the fibroins compare to other fibrous proteins, the subject has been rarely studied and thus a reference database had to be established first.

We have developed a protocol to solubilise modern and archaeological silks and identify their peptide sequences by conventional proteomics employing high-resolution LC-MS/MS. Seven different species of Bombyx, Antheraea and Samia silks were solubilised and enzymatically digested, and analysed by nanoLC-MS/MS. The MS/MS results were de novo analysed using PEAKS software using a silk database consolidated from the experimental and computational protein sequences. The result showed that some of the unique amino acid sequences of each fibroin were successfully captured, enabling the species to be differentiated from one another and identified. The technique was then applied to the analysis of the wild silks of Palmyra and verified its Indian origin.
- 5

### USING SCANNING ELECTRON MICROSCOPY FOR THE STUDY OF MINERALISED TEXTILES: THE CASE OF ROMAN VENETIA

**Abstract author(s):** Gleba, Margarita (Ludwig Maximilian University of Munich) - Busana, Maria Stella (Dept. of Cultural Heritage, University of Padua)

**Abstract format:** Oral

As part of the project TRAMA (Textiles in Roman Archaeology: Methods and Analysis), which aimed to analyse Roman textiles from Venetia (North-East Italy) and adjoining regions, about 30 mineralised textile samples were analysed using conventional textile analytical methods and Scanning Electron Microscopy (SEM). They were predominantly preserved on bronze or iron objects (but also on alabaster) that were excavated from funerary contexts in urban (the main Roman cities including Padua, Verona, Altino, Este, Aquileia), and rural cemeteries of Venetia. Despite the poor preservation of the textile, SEM permitted identification of raw material in most cases: except for one, in fact, fiber origin was identified in the rest. The textile traces include mostly linen and wool fabrics of various qualities. The only additional organically preserved and previously analysed wool textile fragment, excavated from a waterlogged context in Adria, supplies an important comparison for evaluating the typology and quality of textiles of Roman Venetia. The research provides new data regarding the funerary rituals and the textile production, offering, for the first time, a picture of textiles produced in the area.
- 6

### CHALLENGES FOR FIBRE IDENTIFICATION FROM TEXTILE IMPRINTS ON THE UNDERSIDES OF DIRECT OBJECT SEALINGS FROM BRONZE AGE GREECE

**Abstract author(s):** Ulanowska, Agata (Institute of Archaeology, University of Warsaw)

**Abstract format:** Oral

Imprints of threads, cords and textiles on clay (e.g. on pottery and clay sealings) are commonly viewed as a useful source for analysing the properties of actual spun fibres and textiles. However, the quantity and quality of information that can be retrieved from a specific impression varies due to its preservation, clearness, size and properties of the clay fabric, as well as due to the adopted methodology. A substantial collection of imprints of threads, cords and textiles, preserved on plasticine and silicone casts of the undersides of direct object sealings from Bronze Age Greece (e.g. sealings securing pots, chests, baskets or doors) is stored in the Corpus der minoischen und mykenischen Siegel (CMS) in Heidelberg. Those textile imprints are currently being analysed as part of the research project ‘Textiles and Seals. Relations between Textile Production and Seal and Sealing Practices in Bronze Age Greece’. In this paper, impressions of threads and cords from the CMS casts are discussed as a potential source of information about the raw materials used to produce spun/twisted products in the Bronze Age Aegean. Challenges in identifying specific fibres, e.g. fibres from fibrous plants, tree bast and animal fibres, on the basis of their impressions on clay are the main focus of this presentation.

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### WHICH TOOL FOR WHICH FIBER? AN EXPERIMENTAL APPROACH

**Abstract author(s):** Busana, Maria Stella - Francisci, Denis - Lena, Agnese (Dept. of Cultural Heritage, University of Padua)

**Abstract format:** Oral

The TEXPA Project (Textile EXperimental Archeology), carried out by the Department of Cultural Heritage of the University of Padua within the research on Roman textile in North-Eastern Italy, focuses on the link between fibres, especially wool and flax, and textile tools through experimental tests.

Combining 3D scanning and traditional craftsmanship, tools for spinning (spindles, spindle whorls, distaffs) and weaving (loom weights) were reproduced. For the project, spinning tools with specific morphometric and physical features were selected, all coming from Roman burials: a bone spindle with arrow-pointed tip connected to a discoid bone spindle whorl (both very light), an amber hand distaff and a glass ring distaff. The context in which they were found and their features have led scholars to hypothesise that these tools only had a symbolic purpose. On the contrary, experiments showed that these instruments could actually be used: they were suitable for specific types of fibres (especially wool) and the bone spindle with the connected spindle whorl could make a very thin yarn. As regards the weaving, the experimental tests were carried out using reproductions of fictile loom weights with the most common weight, measures and shape in the Roman Venetia. The weaving tests focused on finding out what fibres and fabrics these tools were used for, through a comparison with the kind of fibres and textiles found in the area of research.

Experimental archaeology applied to textile production has once again proved to be a useful method to understand the functions and effectiveness of textile tools and to verify the correspondence between fibres, textiles and instruments.
- a.

### EXPERIMENTAL AND ARCHAEOLOGICAL RESIDUES OF TEXTILE ACTIVITIES: DEVELOPING A PROTOCOL OF SAMPLING AND ANALYSIS OF FIBRE ON TEXTILE TOOLS

**Abstract author(s):** Forte, Vanessa (LTFAPA-Laboratory of Technological and Functional Analysis of Prehistoric Artefacts) - Coletti, Francesca - Celant, Alessandra - Virili, Carlo - Jaia, Alessandro - Lemorini, Cristina (Sapienza University of Rome; LTFAPA-Laboratory of Technological and Functional Analysis of Prehistoric Artefacts)

**Abstract format:** Poster

This contribution presents the results of a research protocol applied in order to investigate residues left by textile activities on tools, in particular spindle-whorls. Textile products are rare to find in archaeological contexts but specific environmental conditions can favour their preservation.

As demonstrated by experimental studies, evidence of spinning and weaving can be represented by residues found in specific areas of textile tools; Indeed, spinning usually favours the deposition of fibre and wood residue along the internal hole of spindle-whorls. Nevertheless, post-depositional processes can affect these deposits, requiring dedicated protocols of extraction and analysis in order to avoid sample contamination and the alteration of the residue structure. Recent experimental researches allowed to identify localisation patterns of fibre residues along with the development of a dedicated extraction protocol. This contribution integrates experimental results with the archaeological evidence, presenting the extraction protocol applied for textile tools coming from the site of Paduli (late Bronze age – early Iron age) in central Italy, where textile activity had an important role in the economy of the community. The preliminary data introduce an interdisciplinary methodological approach based on the collaboration of archaeologists, use wear and residues analysts and palaeobotanists.
- b.

### YARNS FROM THE ASHES: CHARACTERIZATION OF ANCIENT TEXTILES TO ENSURE THEIR CONSERVATION

**Abstract author(s):** Serafini, Ilaria - Coletti, Francesca - Ciccola, Alessandro - Vincenti, Flaminia - Bianco, Armandodoriano - Montesano, Camilla - Postorino, Paolo - Galli, Marco - Curini, Roberta (University of Rome “Sapienza”)

**Abstract format:** Poster

Vesuvius eruption that destroyed Pompeii in AD 79 represents one of the most important events in history, whose impact on both collective image and archeology is outstanding. The cataclysm left behind an abundance of archaeological evidences constituting the most important source of knowledge we have about Ancient Romans daily customs, technology and activities. Their conservation is fundamental; however, it is not possible without a complete characterization.

The set of textiles coming from the Parco Archeologico di Pompei and MANN - Napoli- constitutes the major collection of roman textiles in Italy, an exceptional chance of deepening inside this class of materials. These samples are characterized by a wide range of raw materials and weaving techniques and by a great variety of conservation state degree, including dyed textiles, mineralized fabrics, gold threads [1].

Because of the different properties and particular environmental processes, a multidisciplinary research approach is necessary to maximize the historical information content achievable and to optimize the future conservative plan. In this work, the preliminary results from the characterization of some samples are presented. Current characterization work involves different techniques: Optical and Scanning Electron Microscopies provides information on conservation conditions, morphology and origin of the fiber, while EDX, Fourier Transformed InfraRed and Raman spectroscopies are used to identify inorganic and organic components [2]. Finally, HPLC is used in order to identify natural compounds used in ancient dye-baths [3]. The combination of archaeological knowledge with scientific analysis results in an extensive collection of information about ancient Roman textile manufacturing, from dye-bath



to gilding. This approach will add new tiles in Pompeii history reconstruction and move restores to the correct strategy of restoration and conservation.

[1] M. Galli et al. Restauero, 2017.

[2] I. Serafini et al. L.Microchem J, 2018

[3] D. Cardon, Le Monde des Teintures Naturelles, Belin, Paris, 2014.

c.

### DIGITAL CATALOG OF TEXTILE GARMENTS FROM ARCHAEOLOGICAL RESEARCH IN BIAŁA RAWSKA (18-19TH C., POLAND) - HALFWAY THROUGH THE PROJECT

**Abstract author(s):** Majorek, Magdalena (University of Lodz, Institute of Archaeology)

**Abstract format:** Poster

Present partial results from the implementation of the project (scholarship in the field of archaeological object care) financed by the Ministry of Culture and National Heritage in Poland, which began in January 2020 is the purpose of my poster presentation.

The aim of the project is to digitize, scientifically develop and disseminate on the Internet information about the collection of clothing discovered during archaeological research in the St. Wojciech church in Biała Rawska and popularization of knowledge about methods of protection, conservation and reconstruction of archaeological textile objects, production techniques and fashion of the eighteenth and nineteenth centuries. These activities will allow objects to survive and remain in the memory of recipients for years. The collection includes the following items of clothing from men and women burials:

- fragments of dress and silk haberdashery (burial in coffin No. 2);
- fragments of foulard and vest (burial in coffin No. 3);
- dress fragments and a short silk cape (burial in coffin No. 4);
- fragments of the chasuble and cap (burial in coffin No. 6);
- fragments of the outer garment (burial in coffin No. 7);
- fragments of apron, silk haberdashery, gloves and shoes (burial in coffin No. 9);
- silk dress, pillowcase and haberdashery (burial in coffin No. 12);
- fragments of the kontush sashes and outer clothing (burial in coffin No. 14);
- kontush sashes from Stuck and other clothing items (burial in coffin 15);
- fragments of the dress (burial in coffin No. 17);
- other previously unrecognized textile fragments.

The preparation of the digital catalog of textiles is planned for the end of 2020.”

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### JUST A DEMONSTRATION OF POWER? THE SETTING OF STRONGHOLDS WITHIN THEIR LANDSCAPE [COMFORT]

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Messal, Sebastian (German Archaeological Institute) - Ilves, Kristin (Faculty of Arts, Department of Cultures) - Schneeweiß, Jens (Cluster of Excellence ROOTS, Centre for Baltic and Scandinavian Archaeology - ZBSA)

**Format:** Regular session

Strongholds – places fortified in one way or the other – were social, economic and religious centers for large territories, as well as for smaller, local units. There is no doubt that the location of these centers within their landscape was chosen with considerable care addressing their intended function. We find strongholds being built in the centers, but also at the peripheries of densely populated areas; strongholds are present in marginal regions, too. Strongholds have been situated along as well as at the crossroads of transit routes, both regarding waterways and roads on land. Strongholds are in naturally protected locations, such as islands, lowlands and promontories, but often, the landscape has been modified to facilitate a stronghold. Due to such a cultural and geographical variety, it can be hypothesized that the investigation of the particular situation of strongholds within their landscape might indicate the specific function of the single site. More importantly, however, such investigations also enable – especially under the application of landscape analyses – a reconstruction of possible stronghold networks. These studies facilitate the creation of new knowledge concerning the use of ‘stronghold landscape’ across time and space, and help us to understand how societies using strongholds have been adapting these to the landscape and/or vice versa.

The purpose for this session is to present a comprehensive overview of the current state of research in strongholds within their cultural landscape. In addition, the session aims to summarize and reflect upon the intentions for the establishment of strongholds on particular locations: what reasons were predominant for the situation – functional or strategic, or were strongholds mainly aiming to be just a demonstration of power? In this session, we welcome submissions presenting best practice examples of investigating the landscape of strongholds from different geographical and temporal settings of Europe.

ABSTRACTS

1

### “THOSE WITH POWER BUILT FORTS”- EVALUATING THE ROLE AND FUNCTION OF HUNTER-GATHERER FORTIFICATIONS IN WESTERN SIBERIA

**Abstract author(s):** Schreiber, Tanja - Piezonka, Henny (Institut fuer Ur- und Fruehgeschichte Kiel; ROOTS Cluster of Excellence)

**Abstract format:** Oral

Fortification systems and fortified settlements are to this day regarded mainly as associated with agricultural, generally strongly stratified societies, with high prevalence of violence and social inequality. Considering the fact that the fortified settlements of Western Siberia are connected with hunter-gatherer communities, they represent a peculiar and so far largely unstudied phenomenon which appears around 6000 cal.- BC and can be traced up until the 18th century AD. Visible as house pit depressions, ditches and ramparts on the surface, even after several millennia, they offer great potential for spatial and structural analysis, enabling the study of the causes for and the short- and long-term consequences of socio-economic processes, resulting power relations, and conflict. For this reason, methods of wealth measurement that so far could rarely be applied to heterarchical societies can be implemented here by investigating house-size distributions among hunter-gatherer groups, using statistical tools such as the Gini coefficient. In a pilot study, the level of inequality between the households of selected fortified settlements is compared diachronically to link possible differences in the distribution of power and wealth with different fortification systems as well as with their position in the landscape. Since the reasons for the emergence of fortifications in the social and economic spheres of hunter-gatherer communities are still largely unexplored, ethnographic examples are presented to evaluate the role and probable function of fortifications within acephalous societies. Possible connections to centrality, territoriality, the control of natural resources and thus to social and economic inequality and warfare makes the West Siberian fortified settlements a crucial source for the comprehension of social, political and economic dynamics of hunter-gatherer societies.

2

### WORLDS WITHIN WORLDS: EMBANKED ENCLOSURES AND CULTURAL STRONGHOLDS DURING THE ROMANO-BRITISH PERIOD IN CORNWALL

**Abstract author(s):** Frieman, Catherine (Australian National University) - Lewis, James (Independent scholar) - Jones, Andy (Cornwall Archaeology Unit)

**Abstract format:** Oral

With the Roman invasion of Britain in the first centuries AD, we see a major shift in settlement patterns, social practices and economic structures, which, in Cornwall—Britain’s southwestern-most peninsula—are visible in a major reorganisation of the landscape and the construction of thousands of small, banked and ditched enclosures. These so-called rounds are poorly understood, as only a handful have seen extensive excavation; but they display a remarkable variability in function but most appear to have been constructed from the 1st century AD with some continuing through to the 6th or 7th. Some are settlements, others specialised sites for craft activities, others served functions not yet identified. In this paper we will explore the role these enclosures played for Cornish communities after the Roman invasion. We present case studies drawn from several recently excavated and surveyed rounds and argue that their ubiquity and longevity represent both a fragmentation of pre-Roman economic and kin networks and a their reorganisation into a form that allowed Cornish people to retain their own identity and establish a meaningful way of life even after invasion.

3

### FLUID FORTRESSES IN CHANGING STATES: TATA IN SOUTHERN SENEGAL (13TH-19TH C AD)

**Abstract author(s):** Canós-Donnay, Sirio (Incipit-CSIC)

**Abstract format:** Oral

The term tata is a Western Malinke word designating a fortified political and military centre. In southern Senegal, tata have been a key element in the articulation and conceptualization of political landscapes since at least the 13th C and through multiple polities. These tata fulfilled both practical and symbolic functions: they were often large defensive structures, capable of resisting sieges and attacks but their very presence also indicated the existence of a state-controlled territory linked to Manding political traditions as opposed to a no-man’s land suitable for raiding. While varied in size and construction, some of these fortresses were very substantial, reaching up to 12m in height and featuring multiple rings of walls. However, despite their sturdy appearance, tata were often relatively ephemeral structures whose existence was limited to the reign of a particular ruler. In this paper I will explore the network of tata associated with the states of Kaabu and Fulaadu in southern Senegal and what variations in their location over time can tell us about the articulation of power in the region.

4

### THE PROJECT “ULYCHI. ARCHAEOLOGICAL MAP”

**Abstract author(s):** Manigda, Olga (National Academy of Sciences of Ukraine) - Hrabovska, Olha (Vinnytsya Regional Museum of Local History)

**Abstract format:** Oral

Institute of Archeology of the National Academy of Sciences of Ukraine together with Vinnytsya Regional Museum of Local History renewed the project of archaeological study of Middle Age tribe antiquities which is known from annals as “Ulychi”. It`s a unique

situation that we have more than 30 fortified settlements (fortresses) located densely in the territory of the Middle Bug Basin. They used the features of the relief and location, had special features in their fortification unlike other medieval fortresses of this period. In addition, they have a fairly narrow dating. According to the annals, representatives of the “Ulychy” people inhabited territory of Middle Bug Basin at the beginning of the 11th century.

Material culture indicates a rather short period of life for these fortresses, which does not go beyond the 11th-12th centuries.

The authors of the project plans to create an archaeological map of the habitat of the “Ulychi”; carrying out archeological researches, including non-invasive methods; preparation of the scientific documentation for conservation and protection this sites. A system for monitoring the state of archaeological sites is being developed. All analytical tasks are being implemented by creating an Archaeological Geoinformation System (AGIS) “Ulychi. Archaeological map.”

For the new project the structure of AGIS, cartographic bases, the developed methods of spatial analysis will be used. The relational database is still being filled. The new information will relate to the settlement’s sites and will take into account more than one hundred criteria for describing the site. The expected result of the project is the reconstruction of the functioning of ancient socio-historical organisms - principalities, lands, societies of ancient times, which lived on the territory between the Dniester and the Southern Bug rivers in the 11th cent.

5 HILL-FORTS ON THE ÅLAND ISLANDS: SYMBOLIC MANIFESTATIONS OF LATE IRON AGE POLITIES?

**Abstract author(s):** Ilves, Kristin (University of Helsinki)

**Abstract format:** Oral

Six Late Iron Age (c. AD 550-1050) hill-forts are found on the Åland Islands – in the strategically, midst of the Baltic Sea region situated archipelago made up of nearly 7000 islands, which due to shore displacement resulting in rising shorelines was spatially much more fragmented in the past. Thus, the Ålandic hill-forts were established in what we would call truly maritime landscape of numerous islands and sea, which enabled both easy, waterborne connectivity and mobility as well as detachment and insularity. These hill-forts were built on different islands, but not all immediately connected to coast and/or related to sea routes. Nor can the hill-forts of this clearly restricted geography be univocally connected to any certain settlement pattern. Most of hill-forts (4) are built next to, or on the outskirts of farmland and settlement concentrations, of very notable variation in size and density though. One of the hill-forts stands out with its distinctly ‘offensive’ location on a small and more peripheral rock of an island void of any other Late Iron Age remains, and another one being situated in the middle of a larger contiguous farmland and settlement district. There are also dense settlement areas lacking hillforts, not explained by the lack of suitable geographical locations. However, due to differences in the rich Late Iron Age archaeological material within the archipelago, and the distribution of the hill-forts, it has been suggested that Åland consisted of two broad polities at that time, and both had a set of three hill-forts each. In my contribution, I will discuss the setting of these hill-forts, and will reflect upon if the Ålandic hill-forts can be regarded as symbolic manifestations of separate polities i.e. organized groups with social hierarchies and conventions of conduct differentiating themselves from other organised groups.

6 THE DEVELOPMENT OF STRONGHOLDS IN A HIGHLY DYNAMIC RIVER LANDSCAPE – THE HÖHBECK CASE AT THE ELBE RIVER

**Abstract author(s):** Schneeweiss, Jens (Institute for the History of Material Culture RAS; Centre for Baltic and Scandinavian Archaeology; Kiel University)

**Abstract format:** Oral

The Höhbeck is an insular elevation in the middle of the vast Elbe River floodplain. It was a strategically important place in the Early and High Middle Ages. This is reflected in an unusually high density of strongholds, which are situated in the surrounding lowland as well as on top of the hill. The Meetschow site at the foot of the Höhbeck was of major importance for several centuries, even when political power changed. Saxons, Franks, Slavs and Germans all kept their main fortification at this place – obviously because of its topographical position, controlling the intersection of a water route and a land route. The significance of Meetschow ended with the end of the 10th c. and was declining until the final abandonment, while Lenzen on the other bank of the river developed into the administrative and political centre of the region. Geoarchaeological research revealed evidence for a short phase of heavy natural flooding events sometime between 950 and ca. 980 A.D. The paper focuses on the coincidences in the history of strongholds, the political situation and flood activity in the region. The actual impact on the topographical situation around the Höhbeck is still to be verified, but it seems very likely that in this period the river course changed significantly, and thus the course of its crossing, too. It is stressed that a changed routing, induced by large scale natural events, had a direct impact on the function and development of the local strongholds.

7 THE SETTING OF STRONGHOLDS WITHIN THEIR LANDSCAPE - THE TEMPLE FORTRESS OF ARKONA

**Abstract author(s):** Messal, Sebastian (German Archaeological Institute)

**Abstract format:** Oral

Strongholds – places fortified in one way or the other – were social, economic and religious centres for large territories, as well as for smaller, local units. There is no doubt that the location of these either regional or intra-regional centres within their landscape was chosen with considerable care addressing their intended function.

The famous temple fortress of Arkona, the last pagan sanctuary of the Western Slavs, is one of the most impressive strongholds along the southern Baltic coast. The detailed report of the Danish chronicler Saxo Grammaticus of the events of the year 1168 – when Valdemar conquered Rügen and destroyed the temple of the god Svantevit in Arkona – mentions only a short period about the approximately 400-year history of the site. However, as the written sources already prove the specific function as sanctuary it might be assumed that this significance is also apparent in the setting of the stronghold on an exposed promontory on the northernmost tip of the island of Rügen. The paper will summarize the recent investigations in Arkona and discuss probable intentions of the establishment on that particular location.

454 ARCHAEOLOGY AND INFRASTRUCTURE: FUTURE NETWORKS, CONTEMPORARY COLLABORATIONS AND PAST LANDSCAPES

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Stastney, Phil (Museum of London Archaeology) - Huisman, Jerry - van der A, Suzanne (ProRail)

**Format:** Regular session

In this session we explore the networks apparent in the practice of archaeology as part of large infrastructure projects across Europe, and the multiple interactions between physical, economic, virtual and social networking, and the networks of the past, present and future.

The construction of roads, railways, ports, airports, sewers, pipelines and services - all themselves elements of physical networks - are a defining feature of the increasingly interconnected nature of contemporary society. The hitherto unprecedented scale of archaeological work involved in these projects has, in turn, necessitated the emergence of new networks of communication and cooperation between archaeologists, archaeological contractors, statutory bodies, the construction and engineering industries and the public. Networks are also apparent in the archaeology exposed by these projects which, through their large spatial scale, reveal patterns of connectivity and contrast in the past.

We invite papers that explore networks or networking, physical or otherwise, past present or future, in relation to the delivery of large infrastructure projects. Submissions from archaeologists working across all sectors of the archaeological profession and practitioners from beyond the archaeology industry are especially encouraged. Some examples of the questions that will be addressed in this session include:

- How has the relationship between archaeologists and the construction industry changed in recent decades?
- To what extent have large infrastructure projects influenced inter-regional collaboration between archaeologists and archaeological organisations?
- How are the results of these archaeological projects communicated, and what is the contribution of archaeology to the public benefit of infrastructure projects?

ABSTRACTS

1 HIGH SPEED RAIL 2 (UK): LINES OF COMMUNICATION FOR RESEARCHING THE PAST ACROSS A MAJOR INFRASTRUCTURE PROJECT

**Abstract author(s):** Halsted, John - Hopla, Emma (Atkins; HS2 Ltd) - Court, Michael (HS2 Ltd)

**Abstract format:** Oral

Phase One of High Speed 2 rail between Birmingham and London, represents the single biggest historic environment project undertaken in the UK. The route extends for approximately 200km, through eight counties. The results of the programme of archaeological works will enable regional distinctions, connections and networks of the past to be explored across diverse landscapes and broad time periods. In order to maximise the value and public benefit of the archaeological programme, a question led approach has been adopted, through the Historic Environment Research and Delivery Strategy (HERDS). A network of collaborations has been put into place, in order to realise and deliver the strategy, which includes the client (HS2 Ltd), the archaeological and historic environment contractors, local and regional planning archaeologists and Historic England.

HS2 has taken on the curatorial responsibilities formerly carried out by the Local Planning Authorities (LPAs). This has required adaptations to the decision-making process, with a greater emphasis on route-wide strategies. This paper will explore the lines of communication throughout HS2 and the relationships between stakeholders, contractors, site archaeologists and local communities. This paper will discuss how mechanisms for collaboration, consultation, decision-making and engagement are key to the success of a question led approach and these will be discussed in the context of the ongoing heritage programme.

2 ARCHAEOLOGY & INFRASTRUCTURE IN ROMANIA. A BRIEF HISTORY OF THE LAST 30 YEARS PRACTICE

**Abstract author(s):** Bors, Corina Ioana - Damian, Paul Cristian (National History Museum of Romania)

**Abstract format:** Oral

The National History Museum of Romania has an important role and expertise as regards preventive archaeology in Romania, since it is the first institution in this country to set up a dedicated department for this domain, but also considering the direct involvement in

undertaking many research projects of this kind. With over 25 years of experience in this respect, both on institutional and individual level, we aim to present in the framework of this session the outcomes of the preventive archaeological excavations and projects undertaken by the museum’s team, communicating not only about the archaeological discoveries, but also about the institutional, management, financial and legal issues related to it, as well as the co-operation developed in relation with the various stakeholders (the authorities, the developers, the public). On the same time, the paper will provide an overview on how had evolved the national legislation concerning the safeguarding of the archaeological heritage from the 90’s to date, and which was the direct impact on the evolution of the preventive archaeology system in Romania. Another key topic of our paper deals also with the link between preventive archaeology and the sphere of politics. Aside the important achievements obtained throughout the years, a particular notice will be given to the problematic and difficult matters encounter by the museum’s team while participating on preventive archaeological projects, since one have to share these experiences and to learn out of them. Synthesis answers to the 3 main questions addressed by the session’s organizers will be formulated. The professional dialogue among the archaeologists from different countries, as well as setting a set of common best practice guidelines for preventive archaeology worldwide have to be seen as key aspects for providing pathways for a proper development of this specific domain of archaeology nowadays.

3 **25 YEARS OF CONDUCTING ARCHAEOLOGICAL RESEARCH FOR THE RAILINFRASTRUCTURE IN THE NETHERLANDS**

**Abstract author(s):** Huisman, Jerry - van der A, Suzanne (Prorail bv)  
**Abstract format:** Oral

In the year 1995 the Dutch railinfrastructure company, now called ProRail bv, started incorporating archaeological research as a standard procedure when building new railroads.

In the past 25 years the process has changed and with it the networks and relationship between building companys and archaeologists.

In this session we will try to bring forward in which way this changed and we’ll try to provide a glimpse of the future of archaeology at ProRail. Four projects will be highlighted as to provide good insight in the way the world of archaeology changed in the Netherlands and the way this was incorporated at ProRail bv. The Betuweroute, The Hanzelijn, Spoorzone Delft and Groningen De vork are the projects which will be discussed and we will show the change of cooperation between builders and archaeologists.

Last but not least we will explain in what manner the 25th anniversary of archeology at ProRail bv will be celebrated.

4 **SMART COLLABORATION**

**Abstract author(s):** Ribbens, Menno (Expload)  
**Abstract format:** Oral

In this session, we explore how clients and research contractors can work together smarter by introducing the concept of supply chain integration in desktop research.

We will look at the industry of UXO remediation, which has effectively introduced on online platform for collaborating across companies in mapping the presence and risks of unexploded ordnance (UXO) from World War II. Participants share their resources in an online information system and perform desktop research in that same system using well-defined procedures with online registration forms and online GIS tools.

In the session, we will look at projects which have been carried out in this platform - from sourcing of historical materials to final delivery to the customer. The procedure is similar to desktop archeological research.

We will also look at how the UXO industry is now creating a detailed map of World War II events in the Netherlands: which includes the locations of individual German defence works and the allied liberation routes.

How can the archeological society benefit?

5 **LARGE SCALE EXCAVATIONS AND SMALL FENS. EXPERIENCES FROM NORTH ZEALAND, DENMARK**

**Abstract author(s):** Aarsleff, Esben (Museum Nordsjælland)  
**Abstract format:** Oral

In recent years The Museum of North Zealand has conducted large scale excavations prior the construction of a new superregional hospital and derived infrastructural projects in the landscape of Salpetermosen, which is dotted with various sized wetlands.

The planning of a new hospital was a lengthy process that allowed four years of excavation, before the bulldozers entered the area, which was an unprecedented amount of time. This enabled more time to do the excavations, as well as more time to reflect and analyze the findings and structures in the field, than is typically the case.

The combined area (hospital and infrastructure) of investigation is 87 ha, which by Danish standards, is a relatively small area, yet it poses a lot of challenges both financially and methodologically. The many smaller fens contain finds and structures of great importance and of relatively good preservation conditions, but they are also time consuming and extremely expensive to excavate. They can even be quite impossible to trial excavate without destroying the archaeological object. And when it comes to calculating the budget for the excavations it becomes even more difficult; how does one sets a prize on unique finds such as wooden Neolithic

fishing trap systems, or Iron Age peat cuts with an abundance of wooden artefacts?

Most of the constructors show a fundamental understanding of the time needed to make the excavations. As a rule, they also want to use the results in their branding, a development that began around the year 2000 in North Zealand but has grown more and more popular ever since. The same goes for the local community, who take great interest in the many results, and they all consider the archaeology as a part of their shared past.

6 **VALUE FOR (PUBLIC) MONEY: HOW CAN WE EMBED PUBLIC BENEFIT INTO INFRASTRUCTURE ARCHAEOLOGY?**

**Abstract author(s):** Watson, Sadie (MOLA)  
**Abstract format:** Oral

As archaeologists we know that archaeology has the power to transform lives: enhancing social cohesion, providing education and employment, contributing towards the wellbeing of individuals and communities and of course informing planning and development decisions. The vast majority of archaeological work in the UK occurs through development, with publicly-funded infrastructure being the most significant funding stream. However there is not yet sufficient understanding of how we can measure and maximise the public benefit and impact derived from this work. Currently assessments tend to focus on economic benefits, with qualitative measures proving more difficult to evaluate. Sadie will outline a 4 year research project, which initially focusses on establishing what public benefit might be and how we can measure it. It is intended that the results of this will expand cultural participation and reposition archaeology at the core of public spending on infrastructure. Collaboration across Europe through the Europae Archaeologiae Consilium (EAC) is enhancing the research and maximising its impact through the inclusion of European case studies and comparators.

455 **KNAPP, KNAPP - WHO’S THERE? LITHICS AND THEIR INTERPRETATIONAL ATTRIBUTES**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Organisers:** Klecha, Aleksandra (Antiquity of Southeastern Europe Research Centre University of Warsaw; Institute of Archaeology University of Warsaw) - Vornicu, Diana-Mariuca (Institute of Archaeology, Romanian Academy, Iași) - Szegedi, Kristóf (Castle Headquarters Integrated Regional Development Centre Nonprofit Ltd.)  
**Format:** Regular session

Knappable stones, like flint or obsidian, are unusual kinds of raw material. Thanks to various properties they influence the senses with color, texture, degree of transparency; used - they produce sound, react with other materials or signal their origin. Their processing is an acquired ability, a generational process, an important skill in the group, prestigious and universal. They can be transported, given a cultural or symbolic meaning, but most importantly, they can be shaped and adapted to different tasks or granted many functions. Knapping and tools made of corresponding stones accompanied the transformation of humankind from its beginning until the overall generalisation and its replacement with metal working and metal tools. Since, the technological approaches and various needs changed, it can be concluded that with time and humans, other factors were binding. Despite differences, some regularity can be detected and cross-cultural techniques or similar technological, and morphological solutions, applied regardless of time and space, are among them. It is particularly noticeable in Neolithic, where not only Epipaleolithic/Mesolithic influences are visible, but also technological novelties, the continuation of which can be seen in later periods. The aim of the session is to answer on how to consider the attributes of lithic artefacts, what they are informing us about and how they communicate the abilities and capabilities of particular groups. This leads to the questions on how they should be considered when they are compared. In order to respond to this thesis, cultural, technological and functional considerations will be helpful. Their task will be to explain the knapped stones phenomenon and their various evolutions in the context of the environment, time and economic, behavioral and cultural habits of a particular community. The early stages of the Bronze Age were set as the time limit of the session.

**ABSTRACTS**

1 **INTRA-SITE VARIABILITY IN LATE NATUFIAN FLINT ASSEMBLAGES: THE CASE OF RAQEFET CAVE, MOUNT CARMEL, ISRAEL**

**Abstract author(s):** Bermatov-Paz, Gal - Weinstein-Evron, Mina - Nadel, Dani (Zinman Institute of Archaeology, University of Haifa)  
**Abstract format:** Oral

The Natufian culture (ca. 15,000–11,500 cal. BP) played a pivotal role in the transition from hunting-gathering to agricultural economies and sedentary settlements in the southern Levant. Among the rich material remains, the flint assemblages have been studied extensively over the years providing chronological and geographical variability, as well as reconstruction of daily activities.

Raqefet Cave is a Late Natufian burial site located on Mount Carmel (Israel), at the heart of the Natufian ‘core area’. Excavations in the first chamber yielded nearly 30 burials, a variety of bedrock features and a wealth of lithic, faunal and floral remains, including evidence for “flower burials” and wakes by the open graves. The cave site provides a unique opportunity to study the remains from dated burials and from adjacent deep bedrock mortars hewn into the cave floor. The aims of the lithic study are to a) characterize



the flint assemblage, b) map the sources of the raw materials and the utilization variability among them, c) address the taphonomic processes within the two types of contexts (graves and bedrock features) and their cultural significance, and d) use the results to reconstruct activities and possible social networks during the Late Natufian on Mount Carmel and beyond.

The results show intra-site variability between features in the cave. They may be related to a wide range of cultural or social aspects of Natufian lifeways and burial activities, such as knapping traditions, technological and cultural preferences, burial practices and rituals, territory and landscape uses. Comparison to adjacent and contemporaneous sites in the region, such as el-Wad terrace, can help define and characterize settlement patterns, cultural entities and overlapping territories.

2 SYMBOL SYSTEMS OF ANCIENT POPULATION OF KAMCHATKA PENINSULA

**Abstract author(s):** Ponkratova, Irina (North Eastern State University) - Lbova, Lyudmila (Novosibirsk State University)

**Abstract format:** Oral

Research of stone artifacts collection from the multi-layered Ushki V site (VII cultural layer) (Kamchatka Peninsula) suggest a reconstruction of the ancient population symbolic behavior types. The lithic technology with bifacial arrowheads and stemmed projectile points is the oldest in the composition of site and dates near 13-12 thousand years ago.

In the study, methods of formal morphological and technological analysis were used, partly the objects were subjected to a traceology study, in case of detecting paint on the objects, and the pigment compositions were determined by SEM-EDX method.

Products of various shapes, round and oval, represent stone beads, pendants, and blank with one or two holes made of soft rock (about 150 units). Pendants are oval and rounded in profile with one hole in the center or at the edge, or with two at the edges of product. Traces of production of products in the form of grinding, polishing and drilling are recorded.

Stone artifacts as such the flakes without secondary processing from obsidian, flint, chalcedony, were used as disposable skin cutters (possibly for tattooing). In some cases, the presence of paint on the micro-points was noted.

It was established that in this settlement artificial compositions were used to color objects. A wide range of various chemical elements and their compounds is presented in pigment samples based on the analysis of spectral composition of paints in comparison with ethnographic data.

A set of serial products, evidence of their artificial coloring, the presence of carvers (tattoo-tools?) make up the sign systems of the same type of traces, signs with internal connections. Such systems serve for the implementation of individual collective communicative translation processes and indicate the complex structure of the fossil culture of the final Pleistocene in Kamchatka.

3 HOW WERE THE INNOVATIONS IN THE LITHIC TECHNOLOGIES RELATED TO THE SOCIO-POLITICAL CHANGES? THE CASE OF CUCUTENI FLINT ASSEMBLAGES

**Abstract author(s):** Vornicu, Diana-Mariuca (Institute of Archaeology in Iași, Romanian Academy)

**Abstract format:** Oral

During the Vth and IVth millennia BC the territory between the Pruth River and the Carpathian Mountains (nowadays Eastern Romania) was inhabited, for almost a millennium, by the Cucuteni Chalcolithic communities. In this long duration the socio-economic and political context of the mentioned area suffered several changes that impacted the pattern of the settlements, the ceramic decoration and technologies of producing artefacts.

This presentation approaches the transformations of the lithic technology of the Cucuteni culture in terms of raw materials acquisition, debitage and technology of retouching. Tracing these changes is essential when trying to correlate them with the socio-political context of the time and to understand how certain innovations were brought to a technology that still produced most of the tools used in a household. The method used for this purpose was to compare the results of the attribute analysis of the Cucuteni archaeological lithic materials with those of the assemblages from other contemporary communities. This showed that the flint industry from Eastern Romania are connected in the first half of the Vth millennia BC, in terms of technological achievement, with the Southern neighbours, namely the Gumelnița-Kodzadermen-Karanovo VI. In the IVth millennia BC the centre of interest and political power from the region changes to the north and thus the connections to the northern and western route are more visible in the lithic debitage.

4 BEREZOVO 2 – A SETTLEMENT AND SLATE WORKSHOP- ON THE KARELIAN ISTHMUS (NORTH-WEST RUSSIA)

**Abstract author(s):** Tkach, Evgenia (Institute for the History of Institute for the History of Material Culture RAS; Peter the Great Museum of Anthropology and Ethnography, the Kunstkamera) - Muravev, Roman (Independent researcher) - Gerasimov, Dmitriy (Peter the Great Museum of Anthropology and Ethnography, the Kunstkamera)

**Abstract format:** Oral

Workshops are quite widespread since the Neolithic. Among them workshops for the treatment of flint, quartz, amber, etc. are currently known. Workshops for the production of slate artefacts (axes) have been studied in Karelia too. In 2018, excavation of Berezovo 2 workshop-settlement (circa 3500-2900 BC) was carried out on the Karelian Isthmus between the Gulf of Finland and the Ladoga Lake, which made it possible to obtain a representative collection of finds with more than 1000 slate artefacts.

Specialized workshops for treating certain materials (flint, quartz, amber, etc.) are well-known in so-called “Forest” or non-agricultural Neolithic of the Eastern Europe Forest zone. Outstanding examples of workshops for axes of metatuff are presented at the western shore of the Onega Lake in Karelia. A representative collection of more than 1000 slate artefacts was obtained in 2018 from excavation of Berezovo 2 site in the Karelian Isthmus between the Gulf of Finland and the Ladoga Lake.

Tools for fishing (sinkers, composite fishhook shanks and stings), hunting (projectile points), woodworking (chisels, adzes etc), etc. are presented. Apparently, the collection represents the full technological context for the manufacture of some of the listed slate tool categories: from raw stone bars (1/2 of the total) to intermediate- and end-product. A high percentage of raw slate bars, pre-forms and unfinished blanks with traces of abrasive processing — sawing and/or grinding — is noteworthy. The report will present the results of research and consider the role of this workshop in the scope of the slate industry development on the Karelian Isthmus and adjacent territories in the Late Neolithic - Eneolithic.

The study was performed within the project “Phenomenon of Asbestos Ware in pottery traditions of Eastern Europe: making and use technology, structure of interregional contacts” supported by the Russian Science Foundation, #19-18-00375.

5 TYPE OF WEATHERING OF FLINT ARTEFACTS AS AN INDICATOR FOR ITEMS SELECTION FOR BELL BEAKERS RITUAL DEPOSITS IN NORTH-EASTERN POLAND

**Abstract author(s):** Klecha, Aleksandra (University of Warsaw) - Januszek, Katarzyna (Institute of Archaeology, University of Warsaw)

**Abstract format:** Oral

Four ritual features discovered in NE Poland, identified with the Bell Beaker package, were located on a sandy-gravel elevation (site no. 3), situated on the right bank of the Supraśl river. They provided sets of eco- and artefacts from various raw materials (including flint), also in various quantities. Deposited in diverse arrangements, they usually had a form of small, shallow pits.

In order to explain the rules of qualitative selection of flint artefacts for ritual purposes, as well as to recognise their pre-depositional biography, a SEM analysis of the nature of surface changes of selected artefacts was undertaken. Due to the fact that similar weathering changes can be visible on both, flint and quartz, the selected quartz grains from the sandy fraction located in the direct context of these objects and in the surroundings of the features were also analysed.

As a result, mechanical and chemical weathering (minimal coating) of quartz grains and chemical weathering (etching and minimal coating) on the surface of flint artefacts were detected. The latter indicates that the identified type of weathering is associated with a different than local pre-depositional environment. The last, noticeable process on the objects-the minimal coating is compatible with the one recorded on the surface of quartz grains from both context of deposits. This can mean that the analysed artefacts have been transferred from another (acidic) soil context, which also indicates the ritual dimension of their reutilisation. The paper presents the results of these studies.

a. THE VARIABILITY OF EPIGRAVETTIAN INDUSTRIES OF MIDDLE DNEIPER BASIN: MEZHYRICH AND BARMAKY

**Abstract author(s):** Dudnyk, Diana (Archeology and Museum Studies, Taras Shevchenko National University of Kyiv)

**Abstract format:** Poster

The Upper Palaeolithic of the Middle Dnieper river basin is most fully represented by following Epigravettian industries: Mezhyrich and Mizyn types. The Mezhyrich assemblage belongs to the first one; the Barmaky assemblage – to the second one. The Mezhyrich complex dates around 17 kyr 14C BP as well as Gintsi, Dobranychivka, Semenivka 3; the Barmaky complex - around 19 kyr 14C cal BP. Technical and typological features of industries are using uni- and bipolar cores for blades, bladelets and microblades. Their inventory have similar set of tools: burins, microliths, end-scrapers etc. The prevalence of blades products and fewness of end-scrapers in the assemblage characterizes Barmaky and the feature of microliths is the presence of a straight abruptly retouched lateral edge and obliquely retouched base part. Small narrow lanceolate and microgravettian points processed with fine dorsal and ventral abrupt and semi-abrupt retouch and various truncation of base part characterize the microlithic assemblage of Mezhyrich.

On the settlement area of the Mezhyrich site were found four dwellings made of mammoth bones, which are surrounded by archaeological structures and which constitute separate residential units. It represents base camp such as Gintsi, Mizyn, Dobranychivka. Only two pits with animal bones and marl concentration (crust) were excavated on the Barmaky site. There were no fireplaces found. It is a feature of a short-term camp, such as Semenivka 1-3. The technological and typological characteristics of the lithic assemblage and the specificity of the fauna (mammoth, reindeer, deer, horse, brown bear, wolf, fox, arctic fox and hare) is typical for Epigravettian complexes of the Dnieper basin. Differences in assemblages shows variety of technological traditions and may indicate seasonal variability.

b. THE MAGDALENIAN PERIOD IN BOHEMIA (CZECH REPUBLIC) IN THE CONTEXT OF THE CENTRAL EUROPE

**Abstract author(s):** Záhorák, Vít (Masaryk University)

**Abstract format:** Poster

The Late Upper Palaeolithic in the area of present day Bohemia and Moravia (Czech Republic) is represented by numerous sites of

the Magdalenian culture. These sites, ranging from small short-term hunting camps to long-term settlements, have yielded a great amount of chipped stone industry. In my Ph.D. thesis I focus on these lithics from selected cave and open-air sites and I am trying to use modern methods of stone tool description to find answers to questions about origin and chronology of Bohemian and Moravian Magdalenian as well as relations between the sites themselves.

The topic of this study is presence of en éperon technology in Bohemian and Magdalenian collections. The main focus of the description of the studied assemblages are blade products. On them I study the means by which were they obtained from the cores like traces of usage of soft mineral hammer versus organic hammer, or presence of additional preparation of the cores. The results will be compared with the Magdalenian collections abroad (e.g. Poland, Germany, Slovakia, Austria) and with the technology of knapping of the so-called Epigravettian collections from Moravia region.

The studied sites are chosen from different regions of the country. Bohemia and Moravia are both represented by equal measure. From Moravia the sites of Balcarka cave, Loštice I – Kozí Hill and Hranice na Moravě V – Velká Kobylanka are already in the process of being worked with, while Bohemian sites like Hostim and Děrává cave will be studied in the near future.

This poster will present only the work in progress and the data presented are subject of ongoing research.

c. **FLINTS ARROWHEADS AND THEIR INTERPRETATIONAL FEATURES. ON EXAMPLES FROM THE BIAŁOWIEŻA FOREST (WESTERN BELARUS)**

**Abstract author(s):** Klecha, Aleksandra (University of Warsaw) - Tkachou, Aleh - Vashanau, Aliaksandr (Institute of History, The National Academy of Sciences of Belarus)

**Abstract format:** Poster

Flint arrowheads are among the most characteristic Neolithic artefacts. Their morphological diversity is often treated as a cultural determinant (see Borkowski 1987). From ethnographical studies we know a variety of forms, which are not particularly related to a given community, but rather to different hunting strategies. Nevertheless, in archaeology, there are premises linking artefacts to specific cultural and social phenomena (at least the authors assume so a priori). Quite characteristic in this case is a group of flint arrowheads from the Białowieża Forest (Western Belarus). During excavations in 2017, at the site Kamianiuki 1, located to the north of the Kamianiuki village (Kamenec district) on a sandy elevation along the lagoon of the Leśna Prawa river, seven such arrowheads were found. The site, culturally heterogeneous, is located on the border of two different geographical units (the Western and Eastern European Plains), which is also reflected in the cultural situation of the area. The earliest stages of the site were connected with Late Palaeolithic phases, the youngest ones with the Trzciniec Culture. Numerous artefacts were discovered and the seven arrowheads were found among them. Although the form of these tools differs, the style of their manufacture assigns them to the Paraneolithic phenomenon of the forest zone. This paper presents the results of typo-technological studies on Eastern flint assemblages.

Borkowski, W., 1987. Neolithic and Early Bronze Age heart-shaped arrow heads from the Little Poland Upland. *Archaeologia Interregionalis*, 8, 147–181.”

d. **CHARACTERIZATION OF MANUFACTURE AND USE OF STONE TOOLS FROM HUNGARY THROUGH QUALITATIVE AND QUANTITATIVE ANALYSES OF THEIR SURFACE ALTERATIONS**

**Abstract author(s):** Mester, Zsolt (Institute of Archaeological Sciences Eötvös Loránd University) - Marteau, Julie (Laboratoire Roberval - UMR-CNRS 7337, Université de Technologie de Compiègne, Centre de Recherches de Royallieu) - Deltombe, Raphaël - Moreau, Philippe (Laboratoire d’Automatique, de Mécanique et d’Informatique industrielles et Humaines - LAMIH UMR-CNRS 8201, Université Polytechnique des Hauts de France) - Lengyel, György (Department of Prehistory and Archaeology, University of Miskolc) - Borel, Antony (Histoire Naturelle de l’Homme Préhistorique - HNHP, Muséum national d’histoire naturelle, CNRS, UPVD; Institute of Archeological Sciences, Eötvös Loránd University)

**Abstract format:** Poster

Wear analysis applied to prehistory aims to characterize mainly qualitatively the surface alterations of tools made of stone, bone or other kinds of raw materials in order to determine tools functions and understand past human behaviors. The reliability and repeatability of the method is however questioned and the wear analysts face a major difficulty: to propose quantified and repeatable analyzes and interpretations of traces related to manufacture and use.

We propose to create an experimental reference corpus of traces allowing the characterization of the topographic signatures according to the processes which generated them. This reference collection of surface alterations and their detailed qualitative and quantitative analysis aim at examining 1) what is the variability of surface alterations for and between each tested anthropogenic processes, 2) what repeatable, replicable and standardized protocol can allow to identify and characterize surface topographic signatures of a specific alteration process, 3) what are the appropriate metrological geometric properties, scale, resolution and statistics allowing to discriminate each of the alteration process.

This project focuses on selected stone types from Hungary, commonly found in archaeological sites. The use of focus variation and interferometric microscopes to acquire surface topography and multi-scale surface analysis, from metrology, will allow to develop procedures of documentation and characterization of surface alteration specific to lithic material and to propose models of quantification of traces. Algorithms from artificial intelligence will be used to verify if the models are reliable enough to determine the type of surface alteration undergone by each tool. This automatic recognition and classification of surfaces based on qualitative and

quantitative data of surfaces will represent a breakthrough for the discipline. The application on material from archaeological sites will provide new reliable key data for the understanding of human habits in prehistory.

The project is financed from the NRD Fund (K 132857).

457 **FROM NOVICES TO EXPERTS: DEVELOPMENT AND TRANSMISSION OF TECHNICAL KNOWLEDGE IN PREHISTORY**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Forte, Vanessa (Laboratory of Technological and Functional Analyses of Prehistoric Artefacts) - Castañeda Clemente, Nuria - Romagnoli, Francesca (Universidad Autónoma de Madrid)

**Format:** Regular session

Transmission of knowledge implies social relationships among people that interact during learning processes. The multiple expressions of the Prehistoric societies suggest that different knowledge transmission models probably existed through time, space and social organisations, such as: the autodidactic training, the increasing implication of novices in communities of practice and the selection of pupils taught by an expert. These different systems of learning play a key role in developing social relationships among people and building or reinforcing cognitive capacities of novices approaching new skills.

Nevertheless, addressing these aspects in archaeological field is not an easy task due to the lack of direct behavioural information regarding the interaction between novices and experts and also the difficulty to reconstruct the transmission processes only through the analysis of tools or objects as the final part of a learning sequence. From a methodological point of view, the multidisciplinary approach is currently the preferred method to address the transmission of technical knowledge. Indeed, behavioural and cognitive studies can be extremely helpful in connecting the archaeological data within a wider framework suggesting which human behaviours and cognitive capacities played a key role in these mechanisms. Furthermore, the application of experimental archaeology allows to test hypotheses on learning systems through dedicated and controlled experiments in order to provide interpretative models explaining how knowledge transmission likely worked in prehistoric communities. On these premises, the session aims to bring together scholars interested in apprenticeship systems and skill development to present their researches on prehistoric contexts and discuss the archaeological evidence supporting knowledge transmission, how to methodologically address the reconstruction of learning behaviours and propose models interpreting mechanisms of technical knowledge transmission in ancient human groups.

**ABSTRACTS**

1 **DISENTANGLING TRANSMISSION PROCESSES IN MATERIAL CULTURE: HIGH-RESOLUTION PRESENT-DAY DATA CAN INFORM THE STUDY OF KNOWLEDGE TRANSMISSION IN ARCHAEOLOGICAL DATA**

**Abstract author(s):** Tran, N.-Han (Max Planck Institute for Evolutionary Anthropology) - Waring, Timothy (University of Maine) - Atmaca, Silke - Beheim, Bret (Max Planck Institute for Evolutionary Anthropology)

**Abstract format:** Oral

The archaeological record allows us to observe large-scale patterns across generations that can be seen as a result of biases in cultural transmission at the microevolutionary level. These cultural transmission processes cannot be directly observed at the individual level and are difficult to reconstruct due to time-averaging and often incomplete population-level data. Anthropological data provide possibilities to understand social learning strategies at the assemblage level and allows us to compare contemporaneous data with archaeological data of material culture such as decorative styles in pottery.

This talk will highlight and contextualize the importance of using individual-level and high-resolution anthropological data to understand social learning and the transmission of knowledge in archaeological data. Using the case study of a hand-drawn Tamil artistic tradition called ‘kolam’ from South India, I will explain Bayesian modeling approaches to disentangle transmission processes in material culture. Kolam designs are loop patterns that can be mapped onto a small identifiable set of gestures which is suitable for analyses, specifically in regards to the chaîne opératoire. High-resolution individual-level data on kolam designs were collected, transcribed and digitalized. Kolam designs were quantified by Shannon information entropy and the total number of gestures. Bayesian modeling approaches with a Gaussian process were implemented to model individual-level covariance in design patterns to disentangle the modes of transmission underlying kolam designs. Estimates of continuous covariates and their predictions are reflective of different transmission mechanisms and reveal the relevance of different transmission pathways. Results from high-resolution anthropological data can help reduce the vast space of equifinal transmission and learning mechanisms observed in the archaeological record.

2

CONSTRUCTING THE NICHEs OF/FOR LEARNING AND EXPERTISE. THE ROLE OF PLAY OBJECTS AND OBJECT PLAY IN SOCIAL TRANSMISSION

**Abstract author(s):** Riede, Felix (Department of Archaeology and Heritage Studies Aarhus University) - Johannsen, Niels (Department of Archaeology and Heritage Studies Aarhus University; Interacting Minds Center Aarhus University)

**Abstract format:** Oral

The archaeological record suggests a substantial degree of stability in many past technological traditions, yet the evidence for highly formalised apprenticeship systems is relatively limited until late in prehistory. Under the banner of dual-inheritance theory, substantial understandings of culture change have been achieved by conceptualizing culture as an information-transmission system whose dynamics take on evolutionary properties and by modelling these as such. Building on these conceptual advances, triple-inheritance or niche construction theory further suggests that modifications of the environment by one generation may have lasting effects on the cognitive and behavioural development as well as selective pressures affecting subsequent generations. We here place object play and play objects – especially functional miniatures – from carefully chosen archaeological contexts in such a niche construction perspective and show how both the short-term and long-term effects of plaything construction, provisioning and use have, may have affected the emergence of stable material culture traditions whilst also facilitating innovation. Combining findings from cognitive science, primatology and ethnography with insights into human life-history, we show how play objects and childhood object play can be seen to have had decisive roles in the emergence of innovative capabilities focused on specific material culture domains. Importantly, a closer attention to play objects can go some way towards addressing (i) changes in innovation rates in prehistory and (ii) why innovations occur within certain technological domains but not others.

3

SOCIAL SIGNATURE IN STANDARDIZED CERAMIC PRODUCTION - A 3-D APPROACH TO ETHNOGRAPHIC DATA

**Abstract author(s):** Harush, Ortal (The Hebrew University of Jerusalem) - Roux, Valentine (CNRC - The French National Center for Scientific Research) - Karasik, Avshalom (Israel Antiquities Authority) - Grosman, Leore (The Hebrew University of Jerusalem)

**Abstract format:** Oral

In the course of transmission of knowledge, cultural features are reproduced with variations. The study of variations in material culture is important for understanding the ties between individuals and cultural entities. In this perspective, in the field of pottery, experiments have been conducted to better understand the meaning of variations within a ceramic assemblage, and thus their relation to the cultural context.

We hypothesized that new 3-D methods, using newly developed advanced shape analysis, should make it possible to quantify subtle artifact morphological variability, allowing us to identify cultural, communities of practice, and individual stylistic signatures, even on highly standardized production of ceramic vessels.

With this goal in mind, the 3-D morphology of 320 present-day standardized water jars was captured using photogrammetry. These vessels originate from eight villages distributed across the Jodhpur region (Rajasthan, India) and were made by 23 expert potters divided into two endogamous communities, the Prajapat (Hindu) and the Moila (Muslim) potters.

We were able to automatically distinguish between learning niches. Although we observed trends in the village and individual scale that suggest a lower level of clustering, our results show a clear separation between the two endogamous groups, even when it is imperceptible to the potters themselves. Accordingly, the cultural identity strongly influences the knowledge we transmit and eventually effects the material culture only in high resolution that is not detected by the naked eye.

4

IS THE POTTERY MOLD THAT SIMPLE? A SHAPE ANALYSIS OF MOLD-MOLD POTTERY PRODUCED BY UNIVERSITY STUDENTS

**Abstract author(s):** Cercone, Ashley (Bilecik Şeyh Edebali Üniversitesi; University at Buffalo - SUNY)

**Abstract format:** Oral

Despite the wide application of morphometrics throughout the fields of biology and physical anthropology, the study has barely touched archaeology and material culture. Recently, archaeologists have used morphometrics to answer questions regarding craft production and standardization. With the application of morphometrics, namely, shape analysis, archaeologists can learn more about the required technical knowledge and learned body gestures needed to produce ceramics. In December 2019, an experimental archaeology workshop was held at Bilecik Şeyh Edebali Üniversitesi (Turkey), where first- through fourth-year archaeology and art students were shown how to use a pottery-mold and then asked to replicate the process. Following the workshop, the experimental ceramics were photographed and analyzed using shape analysis. The data was then compared to the results from a shape analysis study that was conducted on experimental pottery produced by a professional potter of more than 30 years. This paper shares the results of this comparative study, as well as discusses broader questions of the transmission of technical knowledge and the development of technical skills in potting communities.

5

LEARNING AND INTERACTIONS BETWEEN KNAPPERS: MODALITIES OF TRANSMISSION OF LITHIC TECHNICAL KNOW-HOW IN THE DANUBIAN EARLY NEOLITHIC OF BELGIUM

**Abstract author(s):** Denis, Solène (UMR 7055 Préhistoire et Technologie; LIATEC, Université de Namur)

**Abstract format:** Oral

Studies on the apprenticeship modalities among knappers of the Danubian Early Neolithic remain to this day extremely rare. In fact, they finally underline the scarcity of elements to fuel the discussion. However, a few criteria aimed at evaluating the level of know-how in production contribute to discriminate between different levels of expertise among the knappers of western Belgium during the Blicquy/Villeneuve-Saint-Germain culture. The spatial distribution of this gradation of skill levels suggests a form of “centralized” learning process involving a form of relationship between one or more tutors and one or more apprentices. But this modality cannot be exclusively invoked to explain the transmission of lithic technical know-how. Indeed, in eastern Belgium, interactions between “mature” knappers with a very good level of skill seem to justify certain evolutions of lithic technical traditions. Also, several transmission modalities could coexist within these agro-pastoral populations, resulting from different levels of social interactions between individuals.

6

LEARNING TO MAKE FLINT AXES ON A FLINT MINE: THE EXAMPLES OF JABLINES LE-HAUT-CHÂTEAU AND FLINS-SUR-SEINE (FRANCE)

**Abstract author(s):** Castañeda, Nuria (Universidad Autonoma de Madrid) - Bostyn, Françoise - Giligny, François (Université Paris 1-Panthéon Sorbonne; UMR-8215 Trajectoires)

**Abstract format:** Oral

This work compares the learning activities that took place in two Neolithic flint mines. Jablines (France) is one of the most important and well-known Neolithic flint mine dated from 4330 to 2230 cal BC and Flins-sur-Seine is another mine within the same region and probably at least partially contemporaneous. Both mines have exploited the same raw material coming from the Bartonian level (Tertiary level). This raw material of good quality were devoted to the production of flint axes that were object of an important production and long-distance exchanges in the European Neolithic.

Neolithic flint mines were the ideal places where a knapper pupil could develop his/her skills. In this paper, a sample of bifacial rough-outs and axes was analysed by means of the analysis of shape and mistakes associations. The analysis confirms aspects already suggested as hinge terminations as a lack of skill marker, the premature abandonment of pieces while someone is learning and the limited access to good quality materials for novices.

The result of this study confirms the discrimination of skill levels in the apprenticeship of making a knapped flint axe at these two mines. The analysis of these skill levels describes which difficulties had novices to deal with to become axe maker specialists and which the progress of learning was.

7

SOCIAL RECONSTRUCTION DURING THE MIDDLE NEOLITHIC IN CATALUÑA: A VIEW FROM POTTERY TECHNOLOGY

**Abstract author(s):** Quevedo-Semperena, Izaro (Sociedad de Ciencias Aranzadi) - Martín-Cólliga, Araceli (Servei d'Arqueologia i Paleontologia de la Generalitat de Catalunya) - Gibaja Bao, Juan Francisco (Institució Milà i Fontanals - IMF-CSIC) - Cubas, Miriam (Universidad de Oviedo)

**Abstract format:** Oral

Funerary behaviour is crucial to afford social reconstruction of Neolithic communities. Several archaeological sites allow us to address the reconstruction of funerary practices during the Middle Neolithic in Cataluña. All these sites have been classified in a recurrence funerary phenomenon known as “Sepulcros de Fosa” culture. This phenomenon was developed between the end of the fifth and the first half of the fourth millennium cal BC, in the north-east of the Iberian Peninsula.

In this research context, the archaeological site of Bòbila Madurell is one of the most emblematic sites of the Vallès Region. It was discovered during the Catalan Railway construction works in 1921, and it was excavated intermittently between 1921 and 2006. More than 170 funerary structures were recorded in the sites, complemented with some pits that might be considered domestic context. Funerary structures are characterized by the presence of a variable number of individuals with a relative abundant associated grave good.

On this paper we contribute to the reconstruction of social dynamics and communities of the Neolithic through the technological analyses of pottery. Pottery samples were recorded both in funerary and non-funerary structures with the aim to explore the differences or similarities among them. The mineralogical analysis by thin section of 45 samples from different funerary and domestic contexts has revealed important aspects related to the raw material procurement and the manufacture techniques.

The results suggest that the raw materials used could be acquired in the environment of the site, although different technological choices are observed both in the preparation of clay and in the identification of the use of temper. Finally, we will discuss the specialised knowledge required to manufacture these vessels.



8

EXPERT LEARNING AND NOVICE LEARNING: ASSESSING POTTING SKILL IN A PERIOD OF TECHNICAL CHANGE

**Abstract author(s):** Jeffra, Caroline (University of Amsterdam)

**Abstract format:** Oral

Reconstructing the journey from novice to expert potter is a complex task; until it is fired, a potter’s work can be recycled back to usable clay. If the majority of a potter’s earliest efforts are missing, then how can we identify the work of complete novices? Furthermore, the possibility of identifying a single person’s body of work is still problematic in prehistoric contexts. That individual’s skill progression as they master the craft is hidden among the many other contemporary vessels which make up an archaeologically-recovered assemblage. Beyond this, it is known that the body of potting knowledge periodically underwent phases of brisk change throughout prehistory, where potters learned and practiced new techniques. In short, the technical practices of the craft changed and potters would have responded – regardless of whether they were novices or experts. In order to gain meaningful insights into the process of knowledge transfer in light of these three particular hurdles, it is necessary to create interdisciplinary methodological frameworks to support interpretive models.

A range of techniques (as well as competence in applying those techniques) is observable in Middle to Late Bronze Age potting communities in Greece. It was during this time that the potter’s wheel was first widely used, creating an environment where experts and novices alike would have been learning the new techniques required for rotational potting. This paper describes the methodological framework developed to explore skills acquisition during this dynamic period of prehistory, relying on experimental archaeology, the chaîne opératoire approach, cognitive development studies, and motor skill measures. By examining contexts in which technical skill negotiations were taking place, this approach reveals clearer evidence of both novice and expert learning. This in turn facilitates more precise interpretations of how these individuals learned their craft, and how learning processes manifested within and across contemporary sites.

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INTERDISCIPLINARITY IN THE ARCHAEOLOGICAL RESEARCH OF RELIGIOUS PHENOMENA

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Gresz, Agnes (University of Pécs Faculty of Humanities, Interdisciplinary Doctoral School) - Gheorghiu, Dragos (National University of Arts, Bucharest Instituto Terra e Memória, Centro de Estudos Superiores de Mação) - Horváth, Tünde (University Wien Department of Prehistoric and Historical Archaeology)

**Format:** Regular session

The session would like to open the door to lectures, which investigate religious phenomena.

The research of religion and ritual, in the lack of written sources, should not be limited to the interpretation of archaeological findings only; it is necessary to involve the methodology of other sciences which, with regard to human development and human nature, deal specifically with religion as a phenomenon.

This approach offers an opportunity to researchers who use the methodology of other sciences in addition to archaeology and ethnoarchaeology, such as the science of religion, cultural anthropology, evolutionary psychology, human ethology, evolutionary biology, cognitive sciences, etc. The organizers would like the development and the evolution of human spirituality from the early Homo sapiens „art” productions or burial customs, to the rituals of complex societies, to be presented from as many viewpoints as possible. With the understand the development of the mental abilitis of the Homo sapiens, we can explain the behaviour and reconstruct the evolvement of the religious life. The purpose of this session is to present methods, hypothesis and theories, which can ad new theoretical perspectives for understanding and interpreting the archaeological record.

Among other things, the session intends to spark a dialogue between researchers of different disciplines, offering various aspects to understand the emergence and the development of the religious phenomena.

ABSTRACTS

1

RITUAL AND COMMUNITY – STUDYING THE IMPORTANCE OF RITUAL WITH APPROACHES FROM THE SOCIOLOGY OF RELIGION

**Abstract author(s):** Hohle, Isabel (Romano-Germanic Commission Frankurt, German Archaeological Institute)

**Abstract format:** Oral

The systematic and methodological study of Religion in Prehistoric Archaeology is still a desideratum. Due to our fragmentary sources it is hard to define features and finds as "cultic", "sacred" or "religious". In fact there are a lot of works in the field of Religious Studies and the Sociology of Religion, that could help us finding a systematic approach and inputs for interpretation for research about Religion in Prehistory. The identification, definition and interpretation of rituals are central in this context.

The talk will focus on the social aspects of rituals. Ritual as fait social can play an important role for social stability, in times of crisis, sustaining social bounding and hierarchies. The perpetuation of frequent events where rituals are prominent can function as a tool for preservation of a community and for the stabilization of social networks and hierarchies. It is my point of departure to study ritual (not just religious ones) from the perspective of the Sociology of Religion (e.g. M. Mauss, E. Durkheim). Case studies will be chosen

from the Late Neolithic of Southeast Europe to demonstrate problems of definitions and classifications of religious rituals and "cult objects". These case studies will be discussed in the context of the interplay of ritual and community.

2

HUMAN UNIVERSALS IN ARCHAEOLOGY

**Abstract author(s):** Gresz, Ágnes (University of Pécs Faculty of Humanities, Interdisciplinary Doctoral School) - Pasztor, Emilia (Türr Istvan Museum)

**Abstract format:** Oral

Through prehistoric examples, the authors present their assumption on how elements of nature (such as fire, water, meteorological-celestial phenomena, sun, moon, etc.) appeared in abstract human thinking. How the relationship between nature and religion has changed, evolved, and become more complex throughout prehistoric times, and how this relationship is reflected in the material culture with which the archaeologist works.

It is presented how the perception of the outside world and human thinking are typified; which universal cultural symbols and phenomena can be found in the study of early human cultures and which of them are related to the natural environment.

For example, the light, the sky everywhere is the symbol of heaven, the divinity, the power beyond the earth. In the presentation, the authors show how to find the depiction and symbol of light and sky among archaeological finds. Numerous examples demonstrate the significance of the analogy-based symbols of different cultures and the universal nature of symbol creation and use. Analysing universal symbols from an archaeological and psychological point of view can help to understand the development of abstract thinking, which is also an indispensable element in the development of spiritual thinking and religious behaviour.

The purpose of the lecture is to introduce a new theoretical approach to the interpretation of archaeological finds and some aspects of human spiritual thinking by raising the problem and critical comparison.

3

THE ICONOGRAPHY OF THE EMERGENT RELIGION IN PRE POTTERY NEOLITHIC A

**Abstract author(s):** Gheorghiu, Dragos (National University of Arts - Bucharest; Instituto Terra e Memória, Centro de Estudos Superiores de Mação)

**Abstract format:** Oral

Located in the northern part of the Fertile Crescent in Upper Mesopotamia, Göbekli Tepe represents one of the largest and monumental early PPN sites in the region. The iconography of the enclosures is very complex and encompasses different levels of meanings representing natural events and anthropomorphic entities.

If the topo-semiotic iconography of Enclosure D is approached from the perspective that animals are indications of the ecotones in which they live, and thus they point to certain types of environments specific to the hunter-gatherers, in this case three paradoxical situations arise in which aquatic animals are placed in relation to terrestrial animals. The terrestrial animals are presented in a lateral position, as if they were floating on the surface of the water after drowning. Such a scenario would have been possible only in the case of catastrophic events, such as floods.

Without minimizing the shamanic characteristics of the Göbekli Tepe monuments, it can be stated that elements of an emerging religion can be recognized here, whose features could be identified later in the historical period. The ritualistic behavior of large groups of people, even if shamanic in nature, is an indication of the emergence of a religious behavior.

If approached from the mythological perspective the flood event visually described in Enclosure D, which could have been the result of a collective trauma, as well as the anthropomorphic monumental entities in the form of T-shaped pillars, can appear to be fragments of an early variant of the Flood Story from The Epic of Gilgamesh, offering an image of the complexity of the emerging religion of the early Pre Pottery Neolithic populations of the Near East.

4

RELIGION, COGNITION AND ANTHRO-ZOOMORPHIC FIGURATIVE FORMS IN THE NEAR EASTERN NEOLITHIC

**Abstract author(s):** Cartolano, Mattia (University of Liverpool)

**Abstract format:** Oral

The appearance of the first domesticates and the adoption of agro-pastoral activities in sedentary communities is often considered the most relevant socio-economic development of the Near Eastern Neolithic. Nevertheless, during this prehistoric period other key social developments emerge such as the establishment of highly cooperative societies of food producers, the formation of corporate identities and the appearance of the first form of religious beliefs in large structured settlements. Such social transformations are visible in the construction of outstanding stone structures such as the tower of Jericho and the enclosures of Göbekli Tepe as well as the emergence of more elaborate mortuary practices. All these archaeological evidence suggest that rituals and symbolic forms constitute an important aspect of the life of Neolithic communities. Within this framework, the production of animal and human figures and the depiction of abstract forms on artefacts manifest a deliberate intent to communicate certain social values that successfully permitted the implementation and maintenance of efficient and extended cooperative units over time. In this regard, different interpretations of the Neolithic social behaviour have been proposed in the past decades that led some scholars to argue the practice of religious belief during this prehistoric phase. Such interpretations have been enriched by the contribution of cognitive studies on complex and large prehistoric societies and theories on the evolution of the human mind. Among these views,

the social brain hypothesis and the theory of extended and/or embodied mind have highlighted the importance of material culture in the Neolithic. Therefore, this paper proposes a further and updated analysis of these aspects in order to better understand the cultural and social transformations of the Neolithic. In this regard, this presentation will outline the socio-cognitive impact of anthropomorphic and zoomorphic figural artefacts in the Pre-Pottery Neolithic communities in Southwest Asia.

5 THE INFLUENCE OF THE ICONOGRAPHICAL TRANSITIONS OF THE STAMP AND CYLINDER SEALS ON THE ANCIENT NEAR EASTERN DEITIES’ PANTHEON

**Abstract author(s):** Ftaimi, Tiffany (Ruprecht-Karls-Universität Heidelberg)  
**Abstract format:** Oral

The seals were used in Mesopotamia since the Neolithic period. The oldest used seals were simple stamp seals, but at the end of the 4th millennium B.C, the cylinder seals replaced them and were used until the 1st millennium B.C. In this last time, both of them were used together. On the seals different scenes were depicted, such as ritual, mythological and daily life motifs.

Deities’ representations appear on seals in several periods in this region. The analysis of these seals offers a huge information and clarification about the communication between the near eastern societies and the creation of their own deities’ pantheon.

In the course of time the deities were represented escorted by their specific attribute animals, objects on both stamp and cylinder seals. These objects and attribute animals helped to identify the anthropomorphic and symbolic representations of deities in different styles and periods. Each particular style of the ancient near eastern eras has been inspired by cultural groups from prior and contemporary traditions.

The methodology applied in this study is focused on the symbolic and anthropomorphic depiction of deities on the seals of the ancient Near East. A comparison of the objects and attribute animals of deities on seals during earlier and later periods will be presented in this study as well. Additionally, the research aims to clarify how has the transition of traditions led to a blend of traditions through social communication and it has influenced their iconographical aspect as their deities’ pantheon as well.

6 THE SCENES OF NETHERWORLD BOOKS ON THE COFFINS OF THE 21ST DYNASTY (UNPUBLISHED STORED COLLECTION FROM THE EGYPTIAN MUSEUM, CAIRO)

**Abstract author(s):** Abdelfattah, Asmaa (Ministry of Antiquities, Egyptian Museum, Cairo; Faculty of Archaeology, Cairo University) - Abdelghany, Khaled (Georg-August-Universität Göttingen) - Eissa, Ahmed (Faculty Of Archaeology, Cairo University)

**Abstract format:** Oral

The netherworld books are a new set of ancient Egyptian funerary texts, began to be used during the new kingdom. They represent the events of the nighttime journey of the sun god Ra through the underworld. In the New Kingdom, The Scenes of Netherworld Books have been extensively and completely applied to the sufficient space on the decorated walls of the royal tombs in the Valley of the Kings. However, by the 21st dynasty, the cliff walls of the royal cache (TT320) and Bab el-Gasus cache were left not decorated, instead that these religious scenes were applied on the funerary equipment (e.g. the anthropoid coffins). Due to the limited spaces on the coffins, the religious scenes had to be abridged and greatly reduced, resulted in producing new type of decorated coffins with composite iconography for the cosmology and the underworld depictions.

This paper presents a comparative analysis of various and evolved iconography of the afterlife on the unpublished coffins of the 21st dynasty which are housed in the storage rooms and the basement of the Cairo Museum.

This research investigates the concepts behind these illustrations, not only by focusing on the study and the interpretation of these new complex iconographic compositions painted on the different sides of the 21st dynasty coffins, in particular, those located under the head of the mummy, but also by tracing its artistic evolution and characteristics from its origins during the new kingdom till its transfer to the much smaller surfaces on the 21st dynasty coffins.

In conclusion, these depictions are the personification of the solar cycle and point to the daily regeneration of the sun god, where the deceased hopes to accompany him in its ongoing revival during the nightly journey for guaranteeing his rejuvenation and affiliation with the sun god each day.

7 OLD SYMBOL – NEW PERSPECTIVE A CASE STUDY FROM SOPRON – BURGSTALL

**Abstract author(s):** Mrenka, Attila (Museum of Sopron)  
**Abstract format:** Oral

There are numerous Early Iron Age sites around present day Sopron. The city lies in the north-western corner of Hungary, right between the foot of the Alps and the marshy lowlands of the Lake Fertő.

The Burgstall (Várhely in Hungarian) is 4.5 km far from the centre of city as the crow flies. The hilltop populated for the first time in the Hungarian Late Bronze Age by the Urnfield Culture. Later on the Early Iron Age Hallstatt Culture build-up a fortification with smaller ramparts. The settlement was also populated later by the La Tène civilisation.

The site however is mainly known about the famous urns with figural depictions. But apart from these there is a lesser known sign. It is first recognised by Sándor Gallus in the mid 1930’s. Surveys did not pay much attention to it, however this little sign could be a key element to understand the conception of resurrection.

The symbol emerged from different origins both geographically and temporal. These histories are indispensable to a better understanding of the Early Iron Age.

8 TWO REFLECTIONS OF LIGHT – THE BRONZE AGE AND THE LATE ANTIQUITY (A COMPARISON)

**Abstract author(s):** Gralak, Tomasz (University of Wrocław)  
**Abstract format:** Oral

Metal objects from the Bronze Age are often characterised by shiny surface and decoration constructed from circular, semicircular and spiral motifs. Probably in this way, the glow of celestial bodies (the sun, the moon, the stars) and their movement through the sky were imitated. It seems that this resulted from the prevailing belief in their

sacred power. It is characteristic that items made in this way appear almost everywhere, where the knowledge of bronze processing arrives. Therefore, this phenomenon can be treated as a manifestation of the prehistoric globalisation processes.

In the late antiquity and the Migration period, the fascination with light is combined with its role in the Neoplatonic philosophy and the Christian religion. First of all, it was considered as a manifestation (metaphor, symbol) of the ideal world opposed to the matter. Therefore, when constructing material objects, light reflecting surfaces were formed or raw materials (precious stones, gold) were used to produce the same effect. This is especially evident in the so-called polychrome style. This phenomenon applies to both jewellery as well as dress and architecture elements. Thus, in two different chronological periods, fascination with light resulted from various reasons. It also had a different impact on the form of material objects.

9 BELIEF WITHOUT RELIGION: AN EXAMINATION OF MATERIAL CORRELATES OF THE AFTERLIFE IN THE NEW WORLD

**Abstract author(s):** van Roggen, Judith (Private Consultant)  
**Abstract format:** Oral

Archaeological inferences of belief, so tied up in contemporary notions of religion, are not made easily by archaeologists, particularly North American archaeologists. The dilemma of a science of religion, under which such inferences might fall, is said by French sociologist and anthropologist, Bruno Latour, to fail because science and religion are incompatible. Religion may be defended by producing “facts” such as that of “Creation Science,” however, religion is powerful not for facts, real or imagined. Its power resides in personal transformation through acts of performance in context, and in the presence of others. This may be precisely why archaeology (the science) and religion (the “belief system”) are seemingly incongruent and explains some of the squeamishness of inferring “belief” to archaeological materials. Unlike Europe and Africa where evidence of such transformations can be dated significantly earlier (most recently inferred for Homo naledi as early as 250,000 years ago), first evidence of belief is visible after the Archaic Period (ca. 7000 - 1500 BCE) on the Colorado Plateau. Here, early agriculturalists used rock shelters to bury their dead in very specific and elaborate ways suggestive, at minimum, of “acts” and ones hauntingly similar to that of their historic descendants. This presentation explores acts of belief and their material correlates using Basketmaker burials to make a case for belief in the afterlife in the specific placement of grave goods and the importance of interdisciplinary analyses of archaeological materials.

10 FROM ELEUSIS TO LYCOSURA: AN INTERACTIVE RELATIONSHIP BETWEEN RITUALS, MYSTERIES AND RELIGION

**Abstract author(s):** Dimopoulou, Sotiria (University of Münster)  
**Abstract format:** Oral

This paper is going to present the mysteries of the goddess Despoina at the temple of Lycosura in Arcadia, Peloponnes and their relationship to the Eleusinian from archaeological, theological, ritual and architectural aspect. The secret character about the teleté in Lycosura in combination with the archaeological finds and the description from Pausanias about the cult statues and their attributes at the cella of the temple of Despoina, give us the opportunity to make some conclusions about the drómēna which took place at Lycosura during the mysteries. The various cult objects, whose contribution was very significant for the cult procession and their religious mysterious character allow us to talk about mysteries with initiation to a secret ceremony. Are we talking about an impulsion to believe in something secret and mystical or was it only the religious needs of the local society to keep Arcadians in connection with the cult at Lycosura? In what way were the Eleusinian and the Arcadian mysteries connected? How could this affect the famous cult in Eleusis the other one of Lycosura, which mostly had a local character? And in what way the secret face of this cult could influence the initiators? Very important parameter for this religious phenomenon was the architectural layout of the sanctuary of Despoina, which transfused this mysterious character.

11 THE VISIBLE INVISIBLE: WOMEN AND ROMAN RELIGION IN DALMATIA

**Abstract author(s):** Mech, Anna (University of Warsaw)  
**Abstract format:** Oral

The nature of available sources means that most of what we know about inhabitants of the Roman Empire is mostly reserved to the privileged groups of society, as they were likely to leave behind long-lasting monuments. Epigraphic monuments, especially votive inscriptions, are thus the best evidence for the presence of women in public places.

The aim of this paper is an attempt to reconstruct the religious life of women who lived in Roman province Dalmatia. Epigraphic monuments were set up – among other reasons – to express the social position of the dedicant. Therefore, it is also possible to track the dedicant’s ethnical origin, find their families or examine the individual intentions of their prayers. Through this analysis, the most valuable insight will be reached into the beliefs of individuals and in what ways the “female religiosity” differed (if at all) from the dominant ancient male narrative. Moreover, an interdisciplinary approach – gender studies, women studies or sociology of religion – combining the different methods will allow to better understand the religious and social phenomena behind the archaeological finds, providing a glimpse into the female participation in Roman religion in provinces, especially in Dalmatia.

a. THE ROLE OF PAINTED DECORATION IN ANTHROPOMORPHIC FIGURES CUCHIMILCOS

**Abstract author(s):** Bak, Judyta (Jagiellonian University)

**Abstract format:** Poster

Votive anthropomorphic figurines cuchimilicos were performed and then deposited in the graves by the people of the Chancay culture (central coast, Peru). For the first time they appeared at the end of the middle horizon, and with further production we notice changes in the style of their performance. They depict a woman or a man, usually with marked sexual characteristics. Figurines are covered with painted decoration, within which we recognize several types of cuchimilco decorations. Among other things, there are patterns that probably reflect makeup, as evidenced by traces of dye in places commonly used to display beauty, i.e. lips and eyes. Or, ornaments that can be interpreted as body painting and tattooing. The presence of these signs may indicate that they also adorned the bodies of the people of pre-Columbian Chancay culture. Votive anthropomorphic figurines were put into graves, they were usually put in pairs, being part of the deceased's equipment. Nevertheless, the purposefulness of this custom is not clearly defined. They were associated with idols and deities, and were associated with fertility and the cult of the dead.

462 THE MONGOL INVASION OF CENTRAL AND EASTERN EUROPE: ARCHAEOLOGICAL AND HISTORICAL INTERPRETATIONS

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Pow, Stephen - Laszlovszky, József (Central European University)

**Format:** Regular session

The Mongol invasion of 1237–42 is among the key formative episodes in Central and Eastern Europe and has long been considered a threshold dividing periods in the development of Russia, Poland, Bohemia, Croatia and Hungary. States of the Balkan Peninsula were also affected by raids and military invasions of the Mongol army and major migration processes were initiated as a result of these military campaigns. A new project has been launched aimed at the research of these events, and it is focused on the short-, middle- and long-term impact of the Mongol invasion of Hungary in its Eurasian context.

This session is organized to present comparative studies in Central and Eastern Europe. Historical and archaeological research have consistently engaged with the topic since the mid-nineteenth century, discussing not only the events themselves, but the reasons for them and their greater historical consequences. During the last two decades, a large quantity of new data has emerged from the field of archaeology. The first significant archaeological excavations were connected to motorway construction, but later these discoveries were followed up by targeted investigations. The new archaeological data has been intensively discussed in Central and Eastern European scholarly circles, but it has not been represented in the recent discussions on the archaeology of the Mongol Empire.

The main aim of this session is to present new data representing different branches of archaeological research (battlefields, settlements, burial sites, material culture, etc.) and to discuss interpretations connected to the catastrophic events. Important research questions such as population movements, settlement desertion, nucleation and urbanization processes will be presented together with various interpretational frameworks of archaeological and historical research. Papers presenting methodological aspects of the short-term changes detected by archaeology and their historical interpretations will also comprise some of the topics of the session.

ABSTRACTS

1 CHURCHES, TREASURES AND THE MONGOL INVASION OF HUNGARY – A COMPARATIVE ANALYSIS OF NETWORKS

**Abstract author(s):** Vargha, Maria (Universität Wien)

**Abstract format:** Oral

It is a generally accepted theory in Hungarian history that the Mongol invasion have accelerated changes in social structures, which had an impact on various levels, from private fortifications to changes in social class, or the church network. The emergence of the parish as a legal entity, and thus the organised parish network in church law can only be traced from the thirteenth century onwards, even in Western Europe. In Hungary, this phenomenon has collided with the Mongol invasion, which restructured the settlement and with that church network as well. There have been previous attempts to recover the destruction of the Mongol invasion, and a

correlation between the density of treasure troves and destroyed villages has been discovered. In the present paper, this thought is carried on a little further, by comparing the twelfth-century church network with the appearance of hoards, and finally, the newly founded churches of the thirteenth century, to have a closer image on the effects and changes of the Mongol invasion on the rural population.

2 THE TOWNS OF MEDIEVAL HUNGARY IN THE PERIOD OF THE MONGOL INVASIONS: WRITTEN AND ARCHAEOLOGICAL EVIDENCES

**Abstract author(s):** Nagy, Balázs (Eötvös Loránd University, Budapest)

**Abstract format:** Oral

The Mongol invasions of Hungary in 1241-42 caused the most significant disaster in the medieval history of the country. Although the main events of the military campaigns were reconstructed by the scholarship of the last decades, but many details of the events have not been clarified yet. One of them is the role and significance of the towns in the defense strategy of Hungary. Usually, it is assumed that the Mongols were not prepared for town sieges, but several examples from their campaigns in the territory of the Kievan Rus' prove their capacity and skills to perform successful sieges, e.g. in Vladimir, Suzdal, and Kiev.

In Hungary, the siege and devastation of the towns marked the process of the invasion of the country, but there were significant differences in the level and gravity of the campaigns. The variances can be explained partly by the location of the given settlement and partly by the structure of fortifications. Some of the main urban centers have been completely destroyed others escaped the sieges.

Among the narrative sources usually, the texts of Thomas of Spalato and Master Roger and used to reconstruct the destruction of the urban centers, but by now the overview of archaeological studies might give a chance to reconstruct the fate of towns in the period of the Mongol military campaigns in a more complex way. The paper will make an attempt to synthesize the written and archaeological evidence on that issue.

3 MILITARIA WITH CONNECTION TO THE MONGOL INVASION OF 1241-1242 NORTH OF THE DANUBE

**Abstract author(s):** Holeščák, Michal (IA SAS)

**Abstract format:** Oral

Militaria, weapons and warrior equipment, are one of the main archaeological sources that can shed more light on the military conflicts and battles. Presented paper shows the spread of the eastern types of weaponry, mostly arrowheads, spearheads and maces, that can be connected with the Mongol invasion of 1241-1242 from the territory north of the Danube, nowadays western and part of the central Slovakia. This area was hit by the Mongol troops led by Orda, son of Jochi, moving from the won battle at Legnica in order to join the main column of Batu. They passed the researched territory and pillaged the countryside, camping for a few months north of the Danube, until the river froze and they crossed it close to Estergom. This presence is documented by various types of archaeological finds, from solitary artefacts to clusters of burned objects, leaving behind them weapons, which analysis shows the typological similarity to the material culture of eastern steppe nomads of Late Medieval Period: tanged arrowheads with specifically shaped blades, narrow spearheads with quadratic cross-section and maces with pyramidal knobs. Mapping of these artefacts shows much higher level of the Mongol presence than the relatively scarce literal sources from the area of present day Slovakia.

4 TVER KREMLIN (RUSSIA): EVIDENCE OF THE SIEGE BY BATU KHAN HORDES

**Abstract author(s):** Zinoviev, Andrei (Tver Science and Research Center in History, Archaeology and Restoration; Tver State University; Higher School of Economics)

**Abstract format:** Oral

One of the old Russian cities, Tver was sieged and ransacked by Batu Khan Hordes on March 5th, 1238 during the invasion of Mongol-Tatars in Rus' in the 13th century. Unlike some other Russian cities, destroyed by hordes, where the cultural layer remains relatively undisturbed, the historical part of Tver, its stronghold where the wooden Kremlin once stood, underwent massive reconstructions. This went to the conclusion that no traces of the early events are preserved. Archaeological excavations of the last ten years revealed that this statement is wrong. Scattered parts of adult and mature male skeletons are associated with the defenders of the stronghold who died during the siege of 1238. Besides, several persons, such as elderly women, disabled man, young woman, and a kid, who died under the burned building are the victims of the siege among civilians seeking protection inside the walls of the stronghold. Remains of the domestic animals among charred human bones indicate that they were probably brought in the place of hiding for the same purpose. A careful study of the osteological material can reveal traces of the long-gone events despite all the later perturbations.



**Theme:** 1. Networks, networking, communication: archaeology of interactions  
**Organisers:** Girotto, Chiara (Goethe University Frankfurt) - Price, Henry (Imperial College London)  
**Format:** Regular session

There has been much hype on the use of applicability of Machine Learning (ML) and Artificial Intelligence (AI). However, its fundamental use is to extract complex patterns which humans do not necessarily see. These methods, especially when multiple are stacked, provide the possibility to highlight patterns previously unknown to the observer. Multi-model approaches, predominantly used in finance and to provide consumers with personalised suggestions are especially powerful in large and fuzzy datasets and in combination with an expert’s opinion reduce the amount of theory based assumptions and approximations within a model.

Whilst providing explanatory insights and subtle new ideas their current framework has to be re-evaluated to harness their power for research in the fields of humanities. Their potential, especially in archaeological research is tremendous and has been explored, e.g. to re-assemble 3D pottery shreds into an object, visual recognition of script or coins, and other object based approaches.

In our session we aim to discuss how ML and AI model outcomes can be used to negotiate different narratives of the past and how to design a framework, to ensure reproducible and documented research. We particularly welcome theoretical and methodical papers as well as case studies.

**ABSTRACTS**

**1      MACHINE LEARNING APPROACHES FOR OPTIMIZED SEMI-AUTOMATIC ANALYSIS OF ANCIENT GRAINS**

**Abstract author(s):** Mircea, Cristina (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca; Molecular Biology Center, Interdisciplinary Research Institute on Bio Nano Sciences, Babes-Bolyai University, Cluj-Napoca) - Mircea, Ioan (Department of Computer Science, Faculty of Mathematics and Informatics, Babes-Bolyai University, Cluj-Napoca) - Potârniche, Tiberiu (Museum of National History and Archeology, Constanța) - Kelemen, Beatrice (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca; Molecular Biology Center, Interdisciplinary Research Institute on Bio Nano Sciences, Babes-Bolyai University, Cluj-Napoca)

**Abstract format:** Oral

The archaeological science of today has reached beyond its initial purpose of collecting artifacts, a more prevalent anthropological dimension. It is not only sufficient to extract the valuable items from the excavation site and to preserve them properly, but seemingly unimportant elements from the premises of an archaeological site have become a golden source of information for researchers especially following the advent of molecular biology, genetics on the one hand and machine learning and artificial intelligence on the other.

The field of bioarchaeology studies not only the human and animal remains from the burial ground to detect genetically relevant correlations or clustering but also tackles the analysis of substances, microbiota and vegetal items that are also encountered on an archaeological site. Items that seemed worthless to archaeologists decades ago, now offer a plethora of information regarding more complex anthropological features of the ancient populations such as their diets, their health status, and their customs.

The present study proposes the employment of several computer vision and machine learning techniques that will allow researchers to obtain reliable meta-information on the cereal grains recovered from the Capidava fortress (Constanța County, Romania). The method enables computer vision techniques enriched with machine learning enhancements to automatically segment the images of grains, detect their contour as accurately as possible, analyze the textural feature of the segmented regions, cluster the regions based on the joint contour and textural priorly extracted features and then use the obtained clusters for an optimized semi-automated labeling of archaeological cereal grains.

Acknowledgments

The present work has received financial support through the project: Entrepreneurship for innovation through doctoral and post-doctoral research, POCU/360/6/13/123886 co-financed by the European Social Fund, through the Operational Program for Human Capital 2014- 2010.

**2      BRINGING MACHINE LEARNING TO TAPHONOMY. IDENTIFYING CARNIVORE TOOTH MARKS IN BONE SURFACE WITH ML ALGORITHMS: CROCODILES AND WOLVES**

**Abstract author(s):** Abellán Beltrán, Natalia (Institute of Evolution in Africa - IDEA; UNED)

**Abstract format:** Oral

Traditionally, the study of Bone Surface Modifications (BSM) has been done by classifying them systematically, which has produce very different results if done by one team of scientists or another. Tooth marks are a big part of BSM. They can be found in any archaeological assemblage and have been studied thoroughly during the past two decades. The importance of their well recognition is knowing what taphonomy calls “agency”, so that further interpretations about the origin of the archaeological site can be made. In previous studies, pits have proved themselves to be good tools to distinguish some carnivores from another’s (crocodile from fe-

lids, for example), but they fail when comparing animals from the same family order, which are much more similar. In this sense, what has been never done is trying to discern among carnivores just by looking at scores. They have always been considered to be more variable, hence less useful. In the present work, Machine Learning (ML) algorithms (CNNs) are used to compare crocodile and wolves tooth scores. The main goal is to spread the use of ML in Archaeology, as well as to test the limits of this new method, in an attempt to make our science much more objective, reducing to minimum the personal bias introduced by the investigator.

**3      PATTERNS OF TRAUMA - USING AI TO DISTINGUISH INTERPERSONAL VIOLENCE FROM ACCIDENTAL INJURY**

**Abstract author(s):** Girotto, Chiara (Independent Researcher) - Price, Henry (Imperial College London) - Trautmann, Martin (A&O Praxis für Bioarchäologie, München)

**Abstract format:** Oral

Distinguishing interpersonal violence from accidental injuries is a vital research component to understand the emergence, complexity and variety of fracture patterns in a socio-bioarcheological and modern context. It offers not only insights to individual personal lives but also the presence, occurrence and sanctioning of violence within a society.

Whilst these patterns can be observed in the past and present their expression changes throughout culture and time. Not only is the expression of violence culture and time specific, lifestyles and modes of subsistence have changed, too.

Therefore, they need to be examined carefully - as differences in the mode and intend of force, be it interpersonal or accidental - can be distinguished by specialists. However, besides sharp and projectile trauma, singular blunt force fractures are often hard to interpret. In general, “pathognomonic” fractures of small scale, non war related, interpersonal violence are extremely rare and their interpretation will and should always involve expert opinions. The potential of ML allows to use a tagged dataset for training and generate models based on the location of the fractures, their lethality, biological sex, age, and burial place of the individuals. It increases in sensitivity through iterations predicts more accurately with time.

This talks presents a proof of concept to use AI based models on published archaeological and modern cases to replicate the divide between accidental injuries and lethal interpersonal violence. We hope to explore the potential of these methods with a critical view on their mechanics and how they can aid to explore new hypotheses, especially considering the vast record of bioarchaeological human remains for population studies. The project aims to expand its transdisciplinary research to the distinction of patterns of interpersonal violence in the future.

**4      DIFFICULTIES TRACING AND INTERPRETING PATTERNS IN COMPOSITIONAL DATA OF METAL ARTEFACTS. WHY ARE THE MORE COMPLEX METHODS NOT ALWAYS USEFUL?**

**Abstract author(s):** Pajdla, Petr (Department of Archaeology and Museology, Masaryk University) - Danielisová, Alžběta - Bursák, Daniel (Institute of Archaeology CAS, Prague) - Strnad, Ladislav - Trubač, Jakub (Charles University, Prague)

**Abstract format:** Oral

Element compositions and isotope signals of metal artefacts represent a nice example of what can be designated as large datasets, especially in terms of the substantial number of features. In archaeology, we usually want to get insights about the provenance of the artefacts, consistency of the studied assemblage in terms of raw materials and employed technology, the similarity with other available assemblages from the given period etc. In terms of machine learning, various unsupervised learning methods are of help here. Feature selection and dimensionality reduction are usually followed by the application of various clustering methods to find meaningful groups in the dataset.

In the case study on a hoard of various artefacts from the La Tène period (4th – 1st century BC), we would like to illustrate some of the difficulties we faced while analysing the data by different unsupervised learning methods. The use of more complex statistical methods is not always leading to better interpretability of the results in archaeology terms.

In our case, sticking to less complicated machine learning methods proved useful in interpreting the results both in archaeological and raw material provenance terms.

The data analysis is implemented in an R environment ensuring reproducibility of the analysis.

**5      THE SEVEN DEADLY SINS OF MODELLING**

**Abstract author(s):** Price, Henry (Imperial College London) - Girotto,, Chiara (Independent)

**Abstract format:** Oral

“Statisticians, like artists, have the bad habit of falling in love with their models” (George Box)

Many Bad Models are Better than One: With Decision trees, once you combine an ensemble, lots of little specialised trees with less overall accuracy, this can improve upon a single decision tree. No individual tree can match an ensemble tree approach, which is currently one of the leading methods for classification. However, these multi-tree approaches do not allow interpretation like a singular tree approach.

Measuring things can affect the outcome: Establishing metrics is always dangerous if they are incentivised, as the tendency of the system to optimise to those key metrics is almost too strong.

Metrics and Rat Tails: A fable often told to data scientists, is the rat tail tale bounty. The King decides to outsource pest control. A reward is offered for every rat tail - as evidence that the rat has been killed. Initially, this is amazing; thousands of rat tails are brought in. However, one day an officer is walking the streets and notices something quite odd, tailless rats. People are merely removing the tails and not killing the rats; this is then followed by reports of people breeding rats and cutting their tails to claim the reward; the programme is instantly discontinued. The rat farmers now seeing no profit, dump all their rats on the street to get rid of them. Now there are more rats than ever.

We will also cover: Assessing Model Slippage: When do your models not work and when to stop and hand over. Model Stacking, Abstractions, Stories and Human Modelling.

6 REALITY IS WHAT I RECOGNISE? CHOICE OF FACTORS AND ML IN SOCIAL ARCHAEOLOGY

**Abstract author(s):** Girotto, Chiara (Independent Researcher)

**Abstract format:** Oral

Especially in prehistoric archaeology datasets are often large, fuzzy and important factors can hardly be determined. When using a model as heuristic process one is often required to select factors that seem relevant to the hypothesis. Predominantly this choice is based on a social model fed with empirical data, essentially blending quantitative with theoretical archaeology.

However, it becomes challenging when the latter is strongly biased or there is simply not enough information to justify a prior selection of relevant indicators. Furthermore, if exploring the realms of quantitative and basic explanatory statistics, the data is often not grouped strongly enough or exhibit clear patterns. Machine Learning can, albeit its own theoretical and methodological problems, distinguish patterns in fuzzy and incomplete datasets. Therefore it offers a new perspective, allowing one to integrate more data, without prior selection and implementing social theory at a later stage of hypothesis building, hopefully generate a more objective model outcome and therefore a better understanding of the past.

This talk aims to give a theoretical perspective on the power of ML in archaeological social theory.

7 MORE THAN THE EYE CAN SEE - MACHINE LEARNING AND ROCK ART

**Abstract author(s):** Horn, Christian - Ling, Johan (University of Gothenburg) - Ivarsson, Oscar (Chalmers University of Technology)

**Abstract format:** Oral

In recent years, over 400 laser scans of rock art panels in Sweden have been produced of rock art dating to the Nordic Bronze Age (1800-550 BC). Among the many thousands of motifs are boats, animals, wagons, humans, etc. In 2019, the Swedish Rock Art Research Archives and its partner institutions started a project that attempts to use the 3D data and automatically classify motifs on the panels. The classification of this material can eventually be used for quantitative approaches to the study of rock art. To this end, an initial convolutional neural network (Faster RCNN) has been trained successfully. This could be used in new projects for statistical analysis and potentially at some point identify individual carvers.

This talk will present the method and preliminary results of the project. In the predictions, we encountered unexpected results and difficulties highlighting the ambiguity of Scandinavian rock art which includes flowing forms, abstractions, and hybrids. Based on these findings, we will discuss the relationship between human creativity and computer vision.

465 NETWORKING: BRINGING SCIENTIFIC APPROACHES TO SENSORY ARCHAEOLOGY

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Malik, Rose (Durham University) - Choyke, Alice (Central European University (Budapest and Vienna))

**Format:** Discussion session (with formal abstracts)

The senses are adaptive, communicative and interpretive. They interconnect the physical, social, emotional and the semantic, informing cognitive development. To engage with the senses from the tangible to the most incorporeal, is it possible to bring scientific approaches to sensory information about ancient societies, people, practices and cultures? And can we merge these individual studies to explore how the sense interact to evolve human societies from the very early hominin periods through to the modern day?

Sensory archaeology can link us to behaviours of ancient peoples. Our understanding has often been placed within conceptual and theoretical narratives, sometimes with anthropological approaches that are based on living societies and presenting a comparative analysis. However, through scientific approaches to explore the senses, we can bring robust empirical evidence that can be used to decrease the spatio-temporal distance between the archaeologist today and the people of yesterday.

Different scientific analysis into taste, vision, smell, sound and touch, can bring us insights into how the individual senses have evolved and how they are essential to evolutionary patterns in societies. But how do they work collectively? In this session, we hope to explore how sensory networking and interactivity can provide essential information for today's archaeologist to inform our interpretations and narratives around ancient cognitive activity; its existential and practical manifestations, and how human behaviours and adaptations are demonstrated in past cultures.

ABSTRACTS

1 ARCHAEOLOGY STINKS! FINDING THE SMELL NETWORK IN ARCHAEOLOGY

**Abstract author(s):** Malik, Rose (Durham University)

**Abstract format:** Oral

Smell is a language, communicative and interpretive. It connects the physical, social, emotional and semantic, informing meaning and understanding. As part of the sensory network, we will explore how smell connects with the senses for an adaptive, communicative and interpretive relationship that informs cognitive development.

Olfaction has often been considered a secondary sense player, only enhancing the more obvious senses of taste; but we will explore how the sensory network connects and interrelates to present a more complete understanding of our past cultures. By using an innovative technique to extract odour molecules from ancient materials, archaeologists can engage with the intangible, invisible and incorporeal sense of smell to explore sensorially-based socio-cultural narratives.

Headspace sampling provides a technique that allows direct access to ancient odour molecules, for analysis and interpretation. This technique brings ancient odour to life and provides tangible primary source evidence to inform archaeological understanding of past human behaviour.

Focusing on a critically aware methodology of excavation and analysis, from ancient Egyptian mummies and perfume oil we will examine empirical data to understand the essential and existential properties of mortuary practices during the New Kingdom and Ptolemaic periods in Egypt. The data set extracted from odour analysis will examine how the essential practicalities can be used to inform today's archaeologist interpretations and narratives around ancient cognitive activity; its existential manifestations; and how human behaviours and adaptations are demonstrated.

With a multi-disciplinary focus, the combination of empirical data and archaeological theory paves the way for discussions into other dimensions of investigation. For example, whereas analysis of datasets may reveal the application of particular aromatic agents as part of anthropogenic preservation processes, the broader narrative around the 'essential' ritualised mortuary practice can be explored to provide an understanding of ancient 'existential' cognitive processes that express ontological significance within wider socio-cultural contexts.

468 PRE-CHRISTIAN BELIEFS OF CENTRAL AND NORTHERN EUROPE. INTERDISCIPLINARY INVESTIGATIONS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Szczepanik, Pawel (Institute of Archaeology Nicolaus Copernicus University in Toruń) - Jelcic, Anna (Department of Archaeology and Classical Studies, Stockholm University) - Karpinska, Klaudia (Museum of Cultural History; University of Oslo)

**Format:** Regular session

The proposed session is intended to provide an overview of the recent studies dealing with diverse research questions regarding pre-Christian religions and beliefs of the Central and Northern Europe from the 6th to the 13th centuries. Matters of the conversion, transition from traditional beliefs to Christianity, human-animal relations, rituals practices and landscape studies could be some of the most interesting themes. During the session we hope to present innovative interdisciplinary methods used in the research concerning pre-Christian beliefs and how results of these analyses changed our understanding of the period. We also intend to demonstrate how in these investigations we can, and rather must, use theories and methods gathered from other disciplines. In archaeological study of religion, we draw upon a wide range of sources and methods, but the fundamental question is: how to use them successfully in archaeological research of pagan beliefs? Through presentations and discussions, we'll attempt to offer some answers to this question. Moreover, we would also like to present multiple innovative methods which combine different branches of humanities (e.g. cultural anthropology, history, religion studies) with various fields of natural sciences (e.g. zoology, osteology, landscape studies). We would like to encourage not only humanist scholars to take part in this session but also specialists in different branches of archaeology (e.g. zooarchaeology, osteology, paleoethnobotany) who are interested in pre-Christian religions and beliefs. Contributions from all these research fields are highly welcome.

ABSTRACTS

1 TOPOGRAPHY OF THE SACRED IN THE AREA OF NORTHWESTERN SLAVS IN THE EARLY MIDDLE AGES

**Abstract author(s):** Skrzatek, Mateusz (Nicolaus Copernicus University in Toruń)

**Abstract format:** Oral

The space of the sacred north-west Slavs has been a mysterious, indefinite topic for years that requires a lot of research in the field of religious studies, history, archeology, ethnography and many other fields. The problem is that there are relatively a few confirmed Slavic places of worship. There are many interpretations of researchers from few written sources of the early Middle Ages. The authors of the messages were Christians who, aiming at an unprecedented Christianization, ignored the issues of location, appearance and organization (care) of the place of worship. Christianization was intended to destroy / replace the cult of pagan Slavs by

investing in Christian activities and infrastructure. We can understand the very picture of the functioning and development of the sacred places through the results of archaeological research. Research has so far confirmed two main types of places of worship in this area. These are elevations (single mountains, hills that have a significant leveling relative to the local area) and islands. The universality of the islands and hills in the post-glacial area of North-West Slavs makes us think that there could be many more potential places of worship. Subsequent archaeological and settlement studies allow the creation of a database of confirmed and potential places of worship, with the possibility of their further multi-faceted analysis in terms of topography, space organization and functionality of pagan places of worship in the north-west Slavic area. Geoinformation methods are obtained for research on the topic of topography.

2 IN THE EMBRACE OF OLD GODS...

**Abstract author(s):** Czonstke, Karolina (University of Gdańsk; Archaeological Museum in Gdańsk) - Świątkowski, Bartosz (University of Gdańsk)

**Abstract format:** Oral

Located near Svenek on Bornholm, Sorte Muld, which means "black soil", is one of the most important religious and power complexes in the Baltic Sea region. The numerous findings obtaining such as pottery, bones and weapons indicate the existence of settlement and production workshops in this place. Various traces of far-reaching trade have also been discovered at Sorte Muld.

In central part of the complex, have been already found over 2600 golden foils called "guldgubbe" ("gold men") which were votive gifts offered by residents.

Countless finds and their diversity prove that this place had great importance not only for the local population during the Late Germanic Iron age and Migration period but was an important religious centre in the southern Baltic region too.

Archaeological research conducted in the 1980s showed the existence of significant cultural layers. Unfortunately it was impossible to observe any regular structures and features at that time. However, the excavation undertaken in 2019 by researchers from Bornholms Museum, the University of Aarhus and the University of Gdańsk as a part of the ArchaeoBalt project, gave impressive results, which unveiled a piece of the secrets held by the old gods at Sorte Muld.

3 WITH WHAT IN AFTERLIFE – THE EXPERIENCE OF “PAGANISM” IN POMERANIAN SKELETAL CEMETERIES WITH POLISH LANDS IN THE X-XIII CENTURY

**Abstract author(s):** Bojarski, Jacek (Institut of Archaeology University Nicolaus Copernicus in Torun)

**Abstract format:** Oral

Baptism of Mieszko I began a long process of Christianization of lands, which since the 11th century in written documents are called the Polish state. The archaeological determinant of the change in existing beliefs is the appearance in place of cremation of skeletal cemeteries. In the scientific literature, their presence is considered evidence of conversion, which eventually occurred in the late 10th century and early 11th century. Despite the increasing Christianization until the 12th century, non-ecclesiastical cemeteries, called rural cemeteries, dominate in Polish lands. The dead were buried in simple cavities orientated on the W-E axis, most often with a head pointing west, with everyday objects and jewellery. Unusual layout of the skeleton in the tomb (different orientation, body reversal or arrangement on the side), laying the body in the coffin-chisel, as well as gifts – such as food utensils, objects related to magic are treated as an expression of the experience of paganism. In my paper, I will try to answer questions about whether such custom behaviours are proof of the survival of faith in pre-Christian afterlife or perhaps only in a trace of ancient funeral habits.

4 ELABORATE FUNERALS AND FEATHERY SACRIFICES. BIRDS IN THE VIKING AGE BURIALS AND BELIEFS

**Abstract author(s):** Karpinska, Klaudia (Museum of Cultural History, University of Oslo)

**Abstract format:** Oral

In the Viking Age, differentiated cremation or inhumation funerals took place. Women, men and children were laid on pyres, decks of ships or in pits with numerous objects and animals. What is interesting, is that during these practices there were not only killed mammals (e.g. cattle, dogs, horses) but also various wild and domesticated species of birds (e.g. chickens, hawks, geese). To date, what has been unearthed under mounds (or in the grave pits), were fragmentarily preserved burnt bones (or unburnt skeletons) of the animals belonging to the class Aves. In fact, several graves have been documented with fragments of eggshells that belonged to various domesticated species.

Beyond that, sacrifices of birds are also described in various Norse and non-Scandinavian medieval written sources. They are mentioned inter alia in the description of the complex cremation funeral in Ibn Fadlān's Risāla, part of the puzzling ritual in Saxo Grammaticus' Gesta Danorum and described in the inhumation ritual in Egils saga einheda og Asmundar saga berserkjabana. Moreover, these "airborne beings" are described in poems from the poetic and prose Edda as occupants of the Otherworld, transformations of gods and symbols of inevitable fate.

The main aim of this paper is to present the results of the new analyses of the Viking Age graves from Norway, as well as Öland and Uppland (Sweden) with bird remains. It will present the symbolism of the various species of birds in written sources. Furthermore, this paper will discuss how interdisciplinary methods (connecting archaeology, zoology and history) are used in the above-mentioned research on the meanings of birds in the Viking Age mortuary practices.

5 CAPTURING FRAGILE TRACES OF POST-CREMATATION PRACTICES: INTERDISCIPLINARY COLLABORATION APPLIED TO ANALYSES OF NATURAL PRODUCTS FROM VIKING AGE CREMATATION BURIALS

**Abstract author(s):** Jelacic, Anna (Stockholm University)

**Abstract format:** Oral

Methodological issues that must be considered when assessing the use and implications of natural products occurrence within Viking Age burial space include not only the possible weaknesses in fieldwork methodologies but also a great deal of variation among specific samples in the extent to which they are classified, registered, analyzed and published. Furthermore, a significant challenge is posed by (1) the lack of specialized knowledge of natural products, and (2) the attempt to integrate material from various burial grounds that may all differ with respect to taxonomy, quantity, fragmentation, their taphonomic histories and the biases of contemporary research and cultural heritage interests they reflect. The sheer diversity of traces of post-cremation practices, such as the various plant remains, mineral and rock types, fossils and shells, demands comprehensive knowledge of specialized fields of natural sciences and appropriate laboratory methods for their analyses; an in-depth knowledge which goes beyond the capacity of a single researcher. The aim of this paper is to provide insights into the benefits of interdisciplinary collaboration in cremation studies as drawn from author's experiences with minerology, malacology, and especially with palaeoproteomics (taxon determination of archaeological eggshells using ancient proteins). Each of these fragments of knowledge is seen as a vital building block in reconstructing the biography of the objects used in post-cremation practices.

6 AT THE EDGE OF CHAOS

**Abstract author(s):** Pentz, Peter (National Museum, Copenhagen)

**Abstract format:** Oral

The Volva staff from a Viking age double grave at Klinta, Öland, terminates in an almost square bronze plate decorated with a miniature "landscape" showing a miniature hall or house and one or two animals. This staging is also seen on another similar bronze plate, found in the area of Roskilde, Denmark. The scenery is discussed as a kind of a well-ordered society or micro-world—in terms of Lévi-Strauss "sociétés à maison". The house model also offers an interpretation of the Viking age farm and its enclosure as a barrier between structure and nature's unpredictable lack of organization, between order and chaos, and perhaps even between life and death. The paper will additionally present a new research project at the National Museum in Copenhagen: "Viking Mind and Materiality". Through an interdisciplinary approach, the intentions behind the project is to utilize the increasing information provided by the archaeological material retrieved by metal detecting for understanding the Viking mind.

7 IMAGES OF SACRUM. ANTHROPOLOGY OF IMAGES IN THE STUDY OF PRE-CHRISTIAN SLAVIC RELIGION

**Abstract author(s):** Szczepanik, Pawel (Institute of Archaeology Nicolaus Copernicus University in Torun)

**Abstract format:** Oral

The studies of early medieval Slavic religion, beliefs and magic have very long tradition. The scholars have focused primarily on analysing of negligible written sources, ethnographic materials and finally on archaeological sources. The examination of archaeological artefacts and sites connected with sphere of pre-Christian sacrum is burdened with many problems. These are connected directly with the character of archaeological data and the sphere of interpretation of things and images. The problems are also associated with the quantity and nature of written sources.

In the case of archaeological sources the biggest problem is the possibility of interpreting the meaning of concrete artefacts and their status. In my opinion we need a new methodological perspective to make a new interpretations related to the possibility of understanding of early medieval Slavic religion.

In this presentation I would like to show the assumptions of Hans Belting's "anthropology of images" and David Freedberg's "power of images" theory. These theories will be used in the analysis of specific archaeological artefacts, as well as in approaching fragments of written sources. Those examinations will allow to bring closer the meaning and roles of the images of Slavic sacrum.

This research is a part of the Project financed by National Science Centre in Poland - "Religions and their things. Comparative analysis of early medieval objects connected with religiosity discovered on the territory of Poland".

a. PROJECT PRESENTATION: A DIGITAL EDITION OF THE GOTLANDIC PICTURE STONES

**Abstract author(s):** Oehrl, Sigmund (Institutionen för arkeologi och antikens kultur, Stockholms universitet)

**Abstract format:** Poster

The Gotlandic picture stones are iconic. They are among the internationally most famous historical monuments from Sweden. These exceptional memorial stones, conventionally dated to about AD 400-1100, are covered with figurative images. They are a unique source for studies of Old Norse myths, Pre-Christian cult and religion, as well as early Christianity.

Although much research on the Gotlandic picture stones has been carried out since the early 1940s, most of this research, by necessity, has been based on Sune Lindqvist's edition "Gotlands Bildsteine". However, 75 years after the publication of this book it is quite clear that Lindqvist's edition is outdated, and it is outdated for two reasons. Firstly, his edition only includes 240 picture



stones but today, about 570 picture stones are known. Secondly, all interpretations have been based on Lindqvist’s painted pictures, that is on the fundamental perception of the shallow carved lines by a single scholar. Although Lindqvist was an excellent specialist, his perceptions of the images are sometimes doubtful and have been challenged several times. Consequently, a new digital, more precise documentation of all the monuments is highly needed.

For these reasons, a new project has been started recently, financed by the Swedish Research Council, located at Stockholm University and Gotlands Museum, in order to create a new digital edition of the entire material. The project has three major aims: 1.) Digitization of the entire corpus of Gotland’s picture stones, applying the most advanced 2.5D and 3D recording methods. 2.) Creating an interactive online edition of the picture stones, addressed to both the public and researchers. 3.) New interpretations of the images based on the new documentation as well as comparative studies of similar pictures and ornaments in Northern Europe and the Mediterranean world, as well as research on the stones’ re-use in churches.

470 **NON-INVASIVE REGIONAL SURVEY STRATEGIES: DISCUSSING THE METHODOLOGICAL GOLDEN MEAN**

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Mesterházy, Gábor (Castle Headquarters Integrated Regional Development Centre) - Wroniecki, Piotr (University of Wrocław) - Koller, Melinda (Castle Headquarters Integrated Regional Development Centre)

**Format:** Regular session

Regional and microregional survey projects have a long history in the archaeological research, which aimed to gain a better understanding about a landscape’s settlement network in cultural, social and economic point of views. Field-walking, geophysical prospection, aerial photography, airborne laser-scanning and GIS modelling play a key role during the identification, monitoring and evaluating archaeological resources. Non-invasive survey methods became a crucial element of these integrated researches and also applied in development-led archaeological projects during the heritage assessment and management.

These projects often proved to be the starting point of novel approaches in major and minor methodological and scientific topics and created best-practices for successful fieldwork and interpretation. The recent theoretical and technical advances in non-invasive methods, which provided detailed sampling resolution and increasing daily coverage, are forcing regular check-ups on our integrated survey system.

Therefore, the aim of his session is to discuss the application and impact of different non-invasive methods in heritage management and regional survey strategies. We would like to focus on such topics as optimal distribution of limited resources, data integration and interpretation of large-scale datasets. We invite anyone who would be interested in sharing their thoughts on the connection between the decision-making process of the integrated survey scheme and also on their long-term impact development-led archaeological projects.

**ABSTRACTS**

1 **OVERLOOKED ARCHAEOLOGY? COMPARATIVE REVIEW OF METHODOLOGIES FOR REGIONAL SURVEYS IN POLAND**

**Abstract author(s):** Wroniecki, Piotr (Independent Researcher)

**Abstract format:** Oral

In this presentation I would like to undertake an assessment of the impact of non-invasive techniques of prospection on the archaeological record in Poland, especially in the context of the national field walking programme that has been carried out since the 1980’s. This survey system has recently become the target of some long-awaited criticism. Even though it has been implemented throughout most of the country and in effect viewed as rather complete, new data is showing that this state of things is not entirely true. An abundance of previously unknown archaeological sites such as abandoned medieval towns and villages, field systems, prehistoric enclosures, cursus monuments or holloways are strongly questioning the current reality.

An important question is why have certain standard categories of sites been so seriously overlooked in Poland? Perhaps the answer lies in the fact that they were deemed to be rare features and the ones that were documented more of an exception that proves the rule. It is interesting that perhaps holding to the idea of the absence of e.g. enclosures, no one was looking for them. It is not surprising that monumental structures, which often occupied multi-hectare spaces were practically not observable on the basis of the dominant field-walking methodology. In effect it is this feedback loop between perception, awareness and choice of methods that most likely is responsible for false negative state of knowledge.

2 **PRODUCTIVE ARCHITECTURE WITHIN UNCHARTED MOUNTAINS IN THE UPPER ICA RIVER BASIN, PERU**

**Abstract author(s):** Acosta Parsons, Diana (BLDAM)

**Abstract format:** Oral

The upper Ica Valley, located in the Peruvian south central high mountains, is characterized by an outstanding, but mostly uncharted, archaeological landscape. The Cambridge University-led “One River Project / PIACI project”, undertook the first systematic archaeo-

logical investigations of the area. This region has been in permanent use since the Early Horizon Period (900-200 BC), with an enduring presence of agriculture and herding communities. For the first time, about 44.160ha ranging between 1150masl to 4200masl, mostly modified by terraces, settlements and semi-artificial wetlands were registered and analyzed.

The in-situ survey proved to be a challenging task, considering the steep slopes, poor road conditions and non-existent archaeological data prior the project. The short field season put a limit on the number of inspected sites, so information gathered indoors was encouraged. Using Qgis, it was possible to do a large scale survey based on satellite imagery, which produced a surprisingly large dataset.

The data recollected allowed to correlate settlement sites with productive areas, in order to explore the vertical use of the land then and now. An assessment of the terraces conservation status in relation with its modern use was possible as well. Finally, a partial reconstruction of the local landscape modification and occupation processes was suggested.

3 **UNDERWATER REMOTE SENSING TECHNIQUES FOR DETECTING AND ASSESSING SHIPWREKS: THE FISCARDO ROMAN SHIPWRECK, IONIAN SEA, GREECE**

**Abstract author(s):** Ferentinos, Georgios - Fakiris, Elias - Christodoulou, Dimitris - Geraga, Maria - Prevenios, Michalis - Kordela, Stauroula - Dimas, Xenofon - Georgiou, Nikos - Papatheodorou, George (Department of Geology, University of Patras)

**Abstract format:** Oral

An offshore survey around Kefallinia Island in the Ionian Sea funded by the INTERREG IV Greece-Italy 2007-2013 Programme has shown the presence of a significant Roman period (1st BC to 1st AD) merchant shipwreck. The survey, carried out by the OCEANUS Network of the University of Patras, using state of art high resolution underwater sonar remote sensing and machine learning techniques in processing seafloor sonar images for automated recognition of ancient wrecks with an amphorae cargo.

The shipwreck, based on the sonar images, is about 34 m. long, 12 m. wide, and 3.3 m. high. The size of this merchant shipwreck is much larger than those, approximately 15 m long that sailed around the Mediterranean between 1st BC and 1st AD, transporting goods within the Roman Empire. The shipwreck dimensions make it one of the four largest merchant shipwrecks of the above-mentioned period, found in the Mediterranean to date. The other three wrecks with an estimated length of about 40m were the ‘Madrague de Giens’, the ‘Albenga’ and the ‘Machdia’.

The amphorae cargo in the hull is about 3,3 m. high, of which 1,3 m above seafloor and 2 m. sunk in the seafloor. The amphorae are in very good state of preservation (Fig. 2a), and about 0.90 m. long and 0.40 m. wide (Fig 2 b). Taking into consideration the size of the ship and amphorae and their storage in the hull, the ship is estimated to have been carrying about 6.000 amphorae in five layers. The shipwreck is considered of significant archaeological importance as with further detailed research, it has the potential of yielding a wealth of information about shipping routes, trading goods, amphorae hull stowage, ship construction, the type of wood used and its source.

4 **FELDLUFTPARK PORI: APPLICATION OF GIS TO LOCATE, RESEARCH AND PROTECT CULTURAL HERITAGE OF THE LUFTWAFFE AIRFIELD IN PORI, FINLAND**

**Abstract author(s):** Väisänen, Teemu (Satakunta Museum)

**Abstract format:** Oral

In this paper, I will discuss desk-based research methods for locating, researching and protecting wartime cultural heritage in Finland. As official guidelines for archaeological field surveys have only recently included WWII sites among the sites of interest, efficient survey methods are needed in order to locate and present such sites for heritage assessment and management. As a case study, I will introduce the process of creating a GIS-based projection of the Luftwaffe Airfield in Pori.

During the Continuation War in 1941-44, many Finnish airfields around the country were used by Luftwaffe in order to provide aerial support to German-Finnish troops in the Eastern Front. One of such airfields was Feldluftpark Pori, which provided material and technical support to Luftflotte 5 division operating in Northern Norway and Finland. During the war, the airfield grew into a complex depot consisting of over 300 constructions, including hangars, aircraft shelters and barracks.

After Finland negotiated a separate peace agreement with the Soviet Union and ordered German forces to leave Finland, German troops in Pori detonated a portion of the depot while retreating. Many more buildings were demolished after the war and their remains were forgotten into the woods surrounding the modern Pori Airport.

As a major part of the WWII remains in Pori had already fallen under modern land use and remaining structures were decaying in the woods, locating and researching any existing remains of Feldluftpark Pori eventually became a topical question. By using archival material and GIS applications, all available spatial data regarding the constructions was combined for the purpose of research, city planning and conservation of structural remains.

Research was conducted in cooperation with Satakunta Museum and it served as a starting point for an extensive conflict archaeological research project that will be presented in a publication and exhibition in 2022.

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### VOIDS IN SETTLEMENT PATTERN DATASETS. BIAS AND UNCERTAINTY OF NON-RESEARCHABLE AREAS IN ARCHAEOLOGICAL MODELLING

**Abstract author(s):** Mesterházy, Gábor (Castle Headquarters Integrated Regional Developpent Centre)

**Abstract format:** Oral

Non-invasive survey methods are widely used across the world as a reliable survey method in scientific and development-led re-searches to locate and identify archaeological features and sites. Many efforts have been made earlier to understand the capa-bilities and limitations of these methods, although most of this work was dedicated to the “found” or “measured” data. Regional or micro regional surveys or even development-led infrastructural projects almost always must face with non-surveyable areas due to temporal or permanent coverage.

A detailed analysis was carried out in a 350 km2 area around the city of Polgár (NE Hungary) to analyse regional-scale effects of land cover on site identification. As a first step three CORINE datasets (CLC100, CLC100 change, Hungarian CLC50) were used to locate and identify the currently researchable areas, but also those zones where the land cover changes altered the survey options in the past decades.

Secondly, land cover categories of the Second Military Survey of the Habsburg Empire were digitized in order to define land cover ex-tents before the 19th century water-regulations in the area, which effected land use drastically. Then environmental variables were selected and weighted with Analytic Hierarchy Process method to characterize favourable conditions for different land cover types in the study area. As a result, an “optimal” land cover was defined. By merging the current and the “optimal” land cover datasets a bias map can be produced, which will characterize the effectively and not effectively researchable areas.

Lastly predictive modelling was carried out in order to fill the settlement pattern voids of non-researchable areas. The modelling results were verified with field survey data in a roughly 20 km2 area (handheld GPS; 25 m track spacing; 100 m collection unit) and targeted magnetometry measurements on grasslands.
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### NON-INVASIVE METHODS FOR VOLGA BULGARIA FORTIFIED SETTLEMENTS MONITORING

**Abstract author(s):** Usmanov, Bulat (Institute of Environmental Sciences, Kazan Federal University) - Gainullin, Iskander (Re-search Centre “Country of Cities”, Kazan)

**Abstract format:** Oral

This work is a part of the research (Russian Foundation for Basic Research project №18-09-40114) aimed at developing a system of monitoring of archaeological sites archeological monuments of the Volga Bulgaria, united by geographical borders on the right bank of the Volga within the Ulyanovsk Region and the Republic of Tatarstan. This region is important for study, because according to archaeological data this area was first inhabited by the Bulgars. A new method for assessing the risks of destruction of archeological sites within the territory of the Volga Bolgar with the use of remote sensing methods, complex field studies and cartographic-geooin-formation approaches to data processing is developed. One of the main used methods is archival and modern remote sensing data analysis that makes able to correct the form of study settlements in comparison with existing plans as well as their size and location in the landscape. Historical maps, archival remote sensing data and orthophotomaps compared to get quantitative characteristics of monument territory damage. Modern instrumental methods have been used in order to collect information on dangerous exog-enous processes and anthropogenic impact within the monument territory. The main result of this study is determination of the boundaries and protection zones of the studied cultural heritage objects and development of recommendations for archaeological sites preservation.
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### „...AND IN DARKNESS ITS NAME IS COVERED” ARCHAEOLOGICAL PROSPECTION OF PERISHED MEDIEVAL CHURCHES IN HUNGARY

**Abstract author(s):** Stibrányi, Máté (Várkapitányság Zrt.)

**Abstract format:** Oral

Due to the peculiar history of the Hungarian Basin, most of its medieval settlement pattern is perished, alongside with their land-mark features: the medieval rural church. Scarcely any of the dense pattern survived in the middle regions: for example, in Fejér County, where there had been 230 churches in 4500 km², only six remained (as ruins) today. The others are demolished and mostly forgotten even by the locals, only to be found with archaeological fieldwork.

However, these landmark ruins are not only former ecclesiastical places, but also crucial parts of the medieval settlement network: all of them had been a parish church of a medieval village. So basically, with the identification of these distinct features, we can also locate the medieval local focal places (like nodes of communication and network) understanding the medieval settlement patterns of the region.

To discover these features at such a large scale, excavation is obviously out of the question, so we needed to set up an integrated approach, applying multiple archaeological geophysical methods as key elements. Using this approach, it’s easily possible to discov-er such a church within a day.

Finding these long-forgotten churches and putting them back on map is useful not only for heritage reasons, but for large-scale regional investigations as well. This is basically a very first step: understanding hierarchy is not easy without identifying the focal

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places. Though we are not there, we might have the tools to achieve it.

### CIRCLES AND LONGHOUSES: CONTRIBUTIONS TO THE INVESTIGATION OF NEOLITHIC SETTLEMENTS IN EASTERN SLAVONIA (CROATIA)

**Abstract author(s):** Meyer, Cornelius (cmprospection)

**Abstract format:** Oral

Slavonia, the land between Drava and Sava rivers is famous for its high dynamics in the expansion of Neolithic settlements, which began around 7,000 BC. However, only a few places have been extensively investigated. From the evaluation of aerial photographs and field surveys, many other potential sites are known which can be assumed on the basis of paleodemographic models, but which have not yet been identified due to a lack of reliable data and suitable aerial photographs.

Between 2016 and 2019 several magnetic prospection campaigns were conducted at Neolithic sites in Eastern Slavonia. The mo-tivations for the measurements are based on the results of field surveys as well as on observations of aerial photographs and high-resolution terrain models.

Although, the magnetic data confirm the earlier assumptions and impress by their high level of detail, the data sets must be consid-ered incomplete in most cases, as the investigations faced serious constraints. Firstly, those undertakings are often characterised by relatively low budgets. Secondly, intensive agricultural use and the small size of the plots of land lead to limited accessibility of the areas under investigation. Furthermore, the limited budgets also imply a methodological narrowness.

The examples presented demonstrate that substantial archaeological information can be obtained even from limited data sets. However, the results must be embedded in a strictly multidisciplinary approach in order to develop more precise prediction models of the prehistoric settlement dynamics of the region

The geophysical prospection campaigns were initiated, funded and strongly supported by the University of Zagreb, the Institut za Arheologiju in Zagreb, the Muzej Slavonije in Osijek, and the Gradski Muzej of Vinkovci.
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### A COMPROMISE BETWEEN WISHES, NEEDS AND POSSIBILITIES. NON-INVASIVE SURVEY OF STRONGHOLDS IN SE GREATER POLAND

**Abstract author(s):** Mackiewicz, Maksym (Archeolodzy.org Foundation; Polish Centre of Mediterranean Archaeology, University of Warsaw)

**Abstract format:** Oral

Strongholds are among the most distinct examples of archaeological sites. They are the result of work undertaken by highly organ-ized, complex societies. Their location was determined by various factors. Very often they were the stage for events of supra-region-al importance, known from written sources. SE Greater Poland is a region with a particularly high density of prehistoric and medieval earthworks, which at different stages of history formed unique and highly functional defensive networks, compact and extensive at the same time. The structures usually can be recognized in the landscape. However, their preservation should not be taken for granted. They remain susceptible to damage due to many natural processes and human activities and as such require special care and attention.

In 2019 a project focused on more detailed recognition of strongholds of SE Greater Poland was started. The area of approximately 6000 square kilometers, marked out by administrative boundaries, included over 100 fortifications. A clear definition of the area of interest allowed to cover these objects with relatively equal attention, consistent field research procedures and documentation standards. The workflow was based on complementary application of non-invasive methods: remote sensing (ALS, aerial prospec-tion, satellite imagery analysis) and geophysics (magnetics), backed by thorough archival queries (archaeological records, historical cartography), what has proved to be a cost-effective approach to achieving the intended goals. No less important – focusing on a limited research area with easier access to sources and execution of formal procedures, allowed to attract local partners and pa-trons, and arouse interest in the local community.

The outcome of the studies benefits many groups, including heritage management boards (mapping and recording of the structures according to modern methods), researchers (new data for settlement studies) and the general public (popularizing archaeology and its new methods, raising the awareness about archaeological heritage).
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### THE ARCHAEOLOGICAL HYBLAEAN LANDSCAPES SURVEY PROJECT: TRACING THE ANCIENT RURAL LANDSCAPES OF SOUTHEASTERN SICILY

**Abstract author(s):** Brancato, Rodolfo (Università degli Studi di Catania) - Cozzolino, Marilena - Gentile, Vincenzo (Università degli Studi del Molise) - Idà, Livio - Mirto, Vittorio (Università degli Studi di Catania) - Scerra, Saverio (Soprintendenza BB.CC.AA. di Ragusa) - Tortorici, Edoardo (Università degli Studi di Catania)

**Abstract format:** Oral

The western Hyblean plateau is located in southeastern Sicily (Italy) in a focal point of the Mediterranean region. The lack of an organic and complete documentation and a concrete need to acquire new data about unexplored areas have required a multi-meth-odological and multi-scale research including the analysis of historical sources, traditional archaeological field surveys, topographic investigations, proximal sensing and micro- to large-scale geophysical prospections (i.e. extensive use of seismic refraction and

MICRO-REGIONAL SCALE SURVEY IN THE BIAŁOWIEŻA PRIMEVAL FOREST (EASTERN POLAND): AN INTERDISCIPLINARY APPROACH

**Abstract author(s):** Niedziółka, Kamil (Institute of Archaeology, Cardinal Stefan Wyszyński University in Warsaw) - Krasnodębski, Dariusz (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Wroniecki, Piotr (University of Wrocław)

**Abstract format:** Oral

The results of archaeological investigation that will be presented in this paper are a part of wider project entitled “Cultural and natural heritage of the Białowieża Forest”. It was launched at in January 2017 and its main aim is a comprehensive, interdisciplinary examination of the archaeological resources of this unique primeval forest with the help of natural sciences. The goal is to map traces of anthropogenic and natural sites of its own form using ALS, their field verification combined with geophysics and test excavations. This paper will focus on the investigation which was carried on in the western part of the forest (Sacharewo forest unit) where accidentally, during the geological drillings, a remains of prehistoric and modern settlement – without any terrain form visible on ALS imagery – were discovered. Treating this as an interesting starting point a geophysical survey was conducted that revealed the presence of potential archaeological objects. This fact was later confirmed while test excavations which additionally gave the opportunity to collect a wide range of palaeoenvironmental sampling. What is more, after careful analysis of the ALS data it appeared, that in the close vicinity of investigated settlement other interesting archaeological features can be found: barrows, charcoal piles or alleged Celtic fields confirming long standing human presence in this area. If we add to this results of palaeoenvironmental analyses and geomorphological survey, as well as the presence of natural objects like river or bog iron ores, we can try to recreate the history of this exceptionally interesting micro-region where numerous archaeological features from different periods were preserved within old-growth forest. A proper interdisciplinary approach with a particular emphasis on remote sensing techniques and palaeoenvironmental investigation will be crucial in this case.

GOING OVER-BOARD OR SHOWCASING THE OPTIMAL? THE IMPACT OF NON-INVASIVE SURVEY ON A LARGE-SCALE DEVELOPMENT LED ARCHAEOLOGICAL PROJECT

**Abstract author(s):** Pendic, Jugoslav (BioSense Institute) - Gligorić, Rada (Jadar Museum)

**Abstract format:** Oral

Development – led archaeological projects are client driven projects. The aim of such ventures is to employ the best available archaeological practice in mitigating a potential conflict between an archaeological resource(s) and an investing party. The aim is, also, to keep the focus on the task set out the very same party, in which case an optimal research strategy needs to be devised. By definition of the word, a strategy that is in mid-range between the bare minimum at one end, and plain overexertion of resources available on the other. While the latter might not be encountered very frequently in development–led archaeological work, the former practice is so common, that can be misplaced for a standard, rather than an anomalous and harmful occurrence.

This presentation leans on an example of a locally important (possibly even game–changing) project that employed wide array of non-invasive survey approaches (geophysical prospection, LiDAR, use of archive aerial imagery and commercial satellite imagery) to a micro–region of Jadar Valley, western Serbia; a region considered for massive infrastructural development. We wish to, by fast-tracking through several years of non-invasive research, discuss the sequence of exploratory works and the resulting impact on the development plans and heritage management. We also wish to examine the latent positive influence on the interpretation of the concept of optimal engagement in preventive archaeology practice in the region.

NON-INVASIVE FIELD SURVEY METHODS USED FOR THE HERITAGE PROTECTION AND ARCHAEOLOGICAL RESEARCH IN HUNGARY

**Abstract author(s):** Koller, Melinda (Várkapitányság Nonprofit Zrt.)

**Abstract format:** Poster

The origins of the Hungarian Cultural Resource Management can be connected with the appearance of large-scale investments. From 2011, before development-led archaeological projects the creation of a Preliminary Archaeological Documentation (PAD) is a necessity by law and the Castle Headquarters Integrated Development Centre is entitled to create this documentations from 2015. The PAD is an archaeological risk assessment, which contains calculations of the time and cost factor of the further archaeological tasks, based on data collection (published literature, archive documents, historical maps), field survey, geophysical prospection and test excavation.

The regional-scale archaeological projects have been started in 1958 with the Hungarian Archaeological Topography, but in the latter decades these surveys have significantly slowed down and stopped. Since our research methods have undoubtedly improved in the latter decades our institution in cooperation with the Hungarian Academy of Sciences started a pilot project in the vicinity of the former royal residence Székesfehérvár, Central Hungary. The scope of the project is to identify the medieval sites with different non-invasive survey methods, and to reconstruct the settlement network in this microregion.

Naturally the aims of the survey methods and their actual preferences are slightly dissimilar in development-led archaeological projects and scientific research due to temporal and spatial differences. One of them focuses on a limited territory, the investment area, while the other is examining a coherent microregion. Additionally, CRM assignments are focusing more on the site identification, intensity, meanwhile during the research projects the settlements inner structure and more precise chronology is a crucial factor. Therefore, the collected data has different quantity and quality.

This paper intent to explore the possibilities of an improved and more detailed analysis of a development-led field survey data collection method for scientific purposes.

UTILISING ARCHIVES FOR CURRENT RESEARCH PURPOSE, THE DIFFICULTIES IN FORWARD COMPATIBILITY, STORAGE, ACCURACY AND ACCESS AND THE PROBLEMS ASSOCIATED

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Forrester, Colin (CIfA; IPHES; URV) - Kaszás, Gabriella (-)

**Format:** Regular session

With the increasing move towards digitisation and paperless recording across the EAA region, and the inherent increase of data storage and reliance on up to date software are we losing the ability to go and utilise past archives and collection to the same standards as modern archives. Finally, what happens if these archives and collections are lost in a fire or through theft?

- This session wishes to explore the many aspects of utilising archives past and present, considering the following points:
- Ease of access to past data and artefact archives across the EAA for future/ongoing investigations or re-evaluation, and how compatible are they with modern systems?
  - Can modern techniques like photogrammetry or CT/laser scanning provide not only greater insights into past collections but also a method of preservation and identification in the case of fire or theft?
  - What problems do early software programs cause in forward compatibility and comprehensiveness?
  - How easy should it be to revisit past archival data and artefacts to possibly change the current understanding or paradigm? i.e. (Geophysical data)
  - Are there conflicts with regional and national law or practice for public, commercial and private concerns and what changes should be encouraged?
  - Should there be a comprehensive EU/EAA Heritage law/directive/good practice guide?

This session is asking for examples of an integrated approach to the ongoing archive debate/situation, especially from a digital perspective. The presentations should be no more than 20 minutes long and can cover both successes and failures. They should include all problems encountered between the two and any lessons learned with the intention of further informing the Digitising the Archive debate within the EAA.

ABSTRACTS

CRISIS? WHAT CRISIS? WHAT DO WE UNDERSTAND BY THE TERM ARCHIVING AND HOW HAS ITS MEANING CHANGED OVER TIME?

**Abstract author(s):** Forrester, Colin (Universitat Rovira i Virgili; IPHES; CIfA)

**Abstract format:** Oral

The title to this introduction to session 472, is very apt, a wonderful album by Supertramp, and a fateful comment by the then Prime minister of the U.K, Jim Callaghan in early 1979 which is known as the “winter of discontent” when the UK like today was committing economic suicide.

Winter of Discontent is also an apt phrase as it’s a quote from Richard the third and the people from ULAS, who excavated the remains of Richard the Third, emphasise that he was only discovered by sifting through the many archives and stories. His rediscovery was in reality only achieved by use of the archives, good and bad over many years.

So what do we mean by terms like archiving, recording, compatibility and availability?

Do we mean to utilise the archive or are modern records of more import.

This session is designed to examine how we can utilise what is already there to inform modern investigations and to make sure that we appreciate the tremendous archive treasure we have already accrued.

We need to explore how we can combine the old with the new to synthesise a new way forward, and make sure that we preserve our archaeological past..



2 GENERATING DATA - BUT WHAT DO WE DO WITH IT?

**Abstract author(s):** Kaszas, Gabriella (-)

**Abstract format:** Oral

Since the “Convention of Malta” is widely applied throughout the European Union, commercial archaeology as well has gained territory in the field of archaeological research. This has resulted in an increase of archaeological investigations with the main aim of documenting what will be lost due to the construction process, while leaving the synthesis and research questions for later. The main logic behind commercial archaeology is that the destroyer (construction company for example) should pay the costs of the archaeological investigation. This type of archaeology creates a lot of data, that still should be synthesised, stored and further utilised, in the near or distant future. In every country there are minimum standards for the way of working in this type of archaeology, and in addition for the recording of the data. This paper aims to show through some hands-on examples, the pros and contra of this system and raises questions about the usability of the data generated. The main questions will be: ‘Are we working efficiently enough?’, ‘Could we do more for less or at least the same costs?’ and ‘What will we do once all the archaeological depositary are filled?’

3 LEGACY ARCHIVES FOR THE FUTURE: THE ETHICS OF ARCHIVING AND DIGITISING LEGACY DATA

**Abstract author(s):** Scardina, Audrey (University of Edinburgh) - Mills, Sam (Independent Scholar)

**Abstract format:** Oral

While modern regulations require archaeological archives to be deposited frequently, there are still many older collections that have yet to be deposited. These legacy archives pose a problem for the archivist charged with bringing them in line with modern standards, due to changes in archaeological practice over time. This in turn may cause issues if the material is ever needed for future archaeological research and work. While the above instance likely is familiar to many archivists working in archaeology or heritage, there are other concerns that are often not addressed by archaeological archive guidelines and frameworks.

Ethics are a common enough issue in archaeology, and are often discussed in terms of excavation, recording, and especially when dealing with human remains. Grey literature from legacy archives pose an interesting dilemma, as often the authors of such works have moved companies or even careers, and their permission is not always granted before the data is accessioned, and potentially made available online. Similar issues extend to material such as correspondence, which can include financial data and even personal tiffs. Interpretations read without the context of a final report or author to check back with also have the potential to cause issues.

In Scotland, archives are regularly referenced in the Archaeology Strategy as a resource for research. Indeed, there has been a push in recent years to look back at legacy research. However, there is often little guidance on how to best tackle the problems, both practical and ethical, associated with legacy archives. This paper will discuss these practical issues, then consider archive ethics in other fields, before finally discussing how these ethical concerns can be mitigated. We will do so reference to our work on a multi-year legacy archive project, as well as our experience with working within Scottish archaeology and heritage.

4 SYNTHESIS: THE WAY FORWARD?

**Abstract author(s):** Forrestal, Colin (Universitat Rovira i Virgili; IPHES)

**Abstract format:** Oral

In a lot of modern papers published recently the term ‘synthesis’ is used but what does it mean. It is all well and good to use all encompassing buzz words to attempt to explain an idea but do these buzz words mean the same thing to all.

To a chemist, synthesis could just mean taking two compounds and producing one or multiple others, in its simplest form. Yet it may mean taking multiple inputs, such as compounds, salts, enzymes and energy to create a basic life form.

So what do the various forms of archaeologists mean by synthesis?

This paper argues that what we actually are arguing for are variations on a theme, some simple, some all encompassing but what cannot be ignored is the previous investigations in the area, the scope, the amount of published data, and the originality of the investigation.

So how do we combine all this data into a coherent narrative, that is best informed at the time, if a later investigation comes along, should the previous be incorporated and if so to what extent.

From certain aspects, an updated narrative is of no use unless it acknowledges previous investigations and synthesise these into the new paradigm.

473 CARPATHIAN BASIN AND ITS BORDERS IN TIME OF WARS BETWEEN FALL OF CONSTANTINOPLE AND THE END OF WORLD WAR 2

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Czarnowicz, Marcin (Uniwersytet Jagielloński w Krakowie) - Vojtas, Martin (Masaryk University)

**Format:** Regular session

Carpathian basin was a promised land for cultures developing in the region or migrating from the East. It was a turbulent land. Traces anxiety could be observed at various archeological sites and sub-regions. Of special interest were the borders forming natural bar-

riers preventing newcomers from entering the region- Carpathian and Alps. They were gaining a special meaning during the times of war. A unique for the modern history of people living in Carpathian Basin was a time of the Great War. The Carpathian basin, being that time, a hinterland of Austro-Hungarian Empire was under constant attack from its neighbors – Russia, Romania, Serbia and Italy. The borders of the region were burning becoming the grave for thousands of soldiers of the fighting armies.

In recent years a new tendency could be observed. In many countries military archaeology becomes popular. What was before mostly reserved for the Western Front of the World War One- a proper archaeological prospection of the battlefields starts to appear also in the East.

Organizers welcome papers discussing archaeological works aiming to document archaeological traces of military activity in Carpathian Basin and, especially on their borders such as Carpathian or Alps, wishing to create the platform for exchanging of information, theories and methods between researchers dealing with the topic in question.

In boarder perspective papers discussing the topic in question in other stages of the region’s development e.g. between Ottoman wars until the end of World War 2 are also welcome.

ABSTRACTS

1 THE IDEA AND SPREAD OF CAMPLIKE, WOOD AND EARTH-STRUCTURED FORTIFICATIONS IN CENTRAL EUROPE, WITH SPECIAL EMPHASIS ON THE CARPATHIAN BASIN

**Abstract author(s):** Szörényi, Gábor (Herman Ottó Museum)

**Abstract format:** Oral

The topic focuses on the mid-15th century, the beginning of the periods discussed in the subject section. The appearance and rapid spread of long-range weapons and firearms resulted in radical changes in fortification architecture. The first reactions to firearms were the appearance of camplike ramparts with wood and earth-structures.

The core area for the idea of wood and earthworks were Bohemia and Moravia. A number of these structures were built during the Hussite wars (1419-1434). After the wars, a host of Hussitian warriors became mercenaries, making a living by fighting in different European conflicts. Note, that the soldiers were a group made up of several nationalities, making a typical international mercenary army.

Civil war broke out in the Hungarian Kingdom between 1440 and 1460. The fighting parties liked to use Hussitian veterans here too. Using the vacuum in power however, the Hussitian mercenaries occupied the Northern region of Hungary, establishing their own political and military might. The basis of their power were the strongholds they have taken, recycling them and modernizing their defences as fast as possible (camplike structure), with the cheapest materials (wood and soil).

During this time, many of these forwarded works were built in the vicinity of castles in Slovakia and Northern Hungary. A very well examined example is the Castle of Sajónémeti, which will be used to display the camplike rampart architecture during this presentation.

Matthias Corvinus has defeated the Hussite invaders in 1460, integrating them into the Black Army. With this host, Matthias had taken the Eastern half of Austria. (1470-1490) During the Austrian campaigns, these ramparts appeared at some castles. Why? This too will be answered during the presentation, using the geophysical assessment of a wood and earth rampart from Styria.

2 ARCHAEOLOGICAL TRACES OF MILITARY ACTIVITY AT THE EASTERN BORDER OF CARPATHIAN BASIN DURING THE 18TH-19TH CENTURIES

**Abstract author(s):** Bolohan, Neculai (Alexandru Ioan Cuza University of Iași) - Demjén, Andrea-Erzsébet (National Museum of Transylvanian History)

**Abstract format:** Oral

The quarantines on the border between the Habsburg and the Ottoman empires were the most important bastions against epidemics. The quarantines and the permanent guards placed on the border (“plăieși” – border guards) formed a sanitary cordon aimed at stopping any epidemic at the borders. The aim of this contribution is to focus on the quarantine from Pricске-Eastern Carpathians that was built in a less important pass (in 1778 there were discussions on transforming the quarantine in a secondary rastellum) and it did not have a complex defensive system. There was only a surveillance spot on Pricске Peak, a fortification consisting of a ditch and a palisade. The written records mention that the fortification on Pricске peak was constructed after the Austrians took over the area, at the beginning of the 18th century. In 1700, under the leadership of general Leiningen, a ditch and palisade fortification was built at Pricске passus. Later on, in 1747, general Bohm briefly described that on the Pricске peak there was a fortified sentry house, manned by a few guards and hussars, watching over the pass. The history of the site will be accomplished by different other local stories regarding the military fortifications in the area.

The geographic and strategic position of the mountain passes along commercial routes has determined the site selection for building the quarantines and the fortifications. The cordon sanitaire represented the defensive line in the anti-epidemics battle, connecting quarantine stations. It was meant to protect not only the lands under Austrian rule, but also the whole Europe from the black plague that permanently afflicted the Ottoman Empire. A chain of surveillance towers was built along the border; the towers were

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THE CARPATHIAN WALL 1915 - THE GREAT WAR IN NORTH-EAST SLOVAKIA

**Abstract author(s):** Vojtas, Martin (Department of Archaeology and Museology, Faculty of Arts, Masaryk university) - Zubalík, Jiří (Institute for Archaeological Heritage, Brno) - Fojtík, Martin (Department of Archaeology and Museology, Faculty of Arts, Masaryk university) - Biško, Richard (Institute for Archaeological Heritage, Brno) - Těsnohlídek, Jakub (Archaia Brno) - Petřík, Jan (Department of Geological Sciences, Faculty of Science, Masaryk University) - Kapavík, Radim (Signum Belli 1914) - Tajkov, Peter (Department Art History and At Theory, Faculty of Arts, Technical University of Košice)

**Abstract format:** Oral

The Carpathian mountains were place of intense fighting between three empires (German, Austro-Hungarian and Russian) during spring of 1915. In this time, one important part of frontline between armies was located on the territory of contemporary north-east-ern Slovakia. This territory was a witness of offensives of both sides, which resulted in up to 45,000 dead soldiers and 250,000 wounded or taken as prisoners of war. After 100 years, we survey this area, where we have chosen several sites for more detailed research. The chosen positions are located in different environment and had different fate during military operations, which makes them suitable for comparisons of survey approaches These sites provides an unique opportunity to answer these questions1) how did the three armies organise building of fortifications at strategically important positions in early spring of 1915; 2) what were con-ditions of trench life in Carpathian battlefield and 3) what part of the narrative could and couldn't have been achieved through used methods. With the use of modern digital methods like LiDAR, GPS, GIS, archaeogeophysics, we can perform spatial analyses. With the help of contemporary manuals, pictures, photographs, memories and modern archaeological documentation of relics, we can digitally reconstruct the appearance of trenches and battlefield. With these reconstructions and visualisations,we can open more possibilities of research and popularization. Therefore, we are able to discover stories connected to places of unique events, which did happen here in these hard times more than 100 years ago.
- 4

CARPATHIAN WINTER WAR. HOW TO RESTORE THE MEMORY OF THE GREAT WAR IN XXI CENTURY WAY.

**Abstract author(s):** Czarnowicz, Marcin - Ochał-Czarnowicz, Agnieszka - Kołodziejczyk, Piotr - Karmowski, Jacek (Jagiellonian University) - Kącki, Marcin (Centre for Technology Transfer CITTRU UJ)

**Abstract format:** Oral

Since 2015 a group of the archaeologists from the Jagiellonian University in Kraków undertakes the research focusing on World War I remains hidden in hilly and forested area of Beskid Niski, a part of the Carpathian range. Year after year well preserved elements of field fortifications such as trenches and dugouts are being discovered and inventoried. These objects are silent witnesses of the cruel history of the Great War. At the beginning of 1915 mountain passes in Beskid Niski and Bieszczady became Austro -Hungarian final frontier preventing the Russian Army from entering to – Pannonian Basin a hinterland of Habsburg Monarchy. Only a few dec-imated from long and bloody fights division defended the Monarchy. What made the situation even worse they need to fight two different enemies – tsarist soldiers as same as winter weather.

During our presentation we would like to present the methodology of our research, showing the solutions used by us in inaccessible area of Beskid Niski to study the material remains of WWI. We will also briefly present the outcome of our research wishing to focus, in more detailed way, on our experiments with restoring the memory of the long-forgotten battles of the Great War. Our aim war to bring the narrative to the way as it should be told in XI century to drag the attention of the young people. The outcome of our experi-ments is mobile application helping the user in search and travel through the abovementioned battlefield of the Great War.
- 5

ON WESTERN BORDERS OF CARPATHIANS: THE END OF WORLD WAR 2 IN SOUTH MORAVIA

**Abstract author(s):** Zubalík, Jirí (Institute for Archaeological Heritage)

**Abstract format:** Oral

South Moravia was place of one of last battle operations in World War 2. From 5th April to 7th May, there were heavy fights between Wehrmacht and Red Army, resulting in 17.000 dead soldiers of Red Army. The casualties of German soldiers are not known.

The German army had constructed many field fortifications in South Moravia. Nowadays, the highest number of relics of those for-tifications could be located around city of Brno and village of Pasohlávky. The fortification on first one consists of zigzag trenches, the latter one was fortified mainly by foxholes. Therefore both sites give us an opportunity to compare them, both in terms of meth-odological approach of their research and evaluation of their defensive characteristics.

Remote sensing data (LiDAR, contemporary and historical aerial photographs) have been used to identify an actual extent of forti-fied areas. Period engineer manuals are important for interpretation of documented relics - for example, The Germans used several types of foxholes like foxhole for one lying soldier or foxhole for two standing soldiers.

With all this data, the fortified areas could be digitalised in ArcGIS. Next, wide spectrum of spatial analysis could be used. The most important ones are viewshed and fireshed analysis, which could tell us about possibilities of defensive fire or observation of an enemy movement.

The result of this work give us a good overview of great German effort of defending its positions and about high intensity of final

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CONTRIBUTION OF ARCHAEOLOGICAL PROSPECTION TO THE RESEARCH OF AN EARLY MODERN BATTLEFIELD NEAR VELKÉ VOZOKANY

**Abstract author(s):** Drozd, Dominik - Neumann, Martin - Bátora, Jozef (Comenius University Bratislava)

**Abstract format:** Poster

Since 1541, the territory of Upper Hungary was continually threatened by the Ottoman armies. The rising power of new Europe-an-Asian Empire was clearly demonstrated by establishing of Ottoman administration in Budin at the same year. Henceforth, the Hungary was divided into 3 parts – Budin Eyalet, Principality of Transylvania and the rest of Kingdom of Hungary. As the Transylvanian aristocracy used to be close ally of Ottomans, the Ottoman territorial expansion was concentrated on the Kingdom of Hungary. Thus its upper (northern) part became the object of numerous marauding campaigns. One of them took place in 1652 in the Žitava valley (SW Slovakia). It gained much attention due to highly discussed battle at Velké Vozokany, where 4 members of Eszterházy family died. Memoires of Pál Eszterházy, letters and other contemporary, as well as, later historical accounts contributed to very hetero-geneous reconstruction of the battle. The exact sequence of battle events invokes, till these days, many questions about the real course of combat. Until now only historical sources could provide us with adequate information. However, new types of sources have become to emerge. Archaeological field prospection has yielded new and innovative insight into the battle itself. Although only small-scale field prospection has been already done, first relevant results came to light that could essentially contribute to better understanding of the whole event.

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THE BIOARCHAEOLOGY OF LETHAL VIOLENCE AND OTHER NOT-SO-ULTIMATE INTERACTIONS: EXPLORING THE INTERFACE BETWEEN TRAUMA AND TAPHONOMY

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Mikulski, Richard (Bournemouth University) - Meyer, Christian (OsteoARC - OsteoArchaeological Research Centre)

**Format:** Regular session

The skeletal evidence for violence is often taken at face value within archaeology. Yet, it is easy to mis-interpret the significance of bony lesions, especially when reliable contextual data is lacking. The condition of skeletal remains results from a wide range of in-trinsic (e.g. age-at-death, sex, health) and extrinsic (e.g. social status, physical environment, post-mortem interval) variables which have potential to influence interpretations of any changes to the surviving bone. Distinguishing between peri-mortem and post-mor-tem changes represents an on-going challenge and understanding the obstacles and limits to interpretation is key especially when errors may continue into interpretation of the associated archaeology.

This session seeks to open up the discussion concerning interpretations of violence as represented in the archaeological record. It encourages the fair but critical evaluation of evidence for violence in skeletal remains, highlighting the importance of considering both the biocultural context (represented by remains and their deposition or burial, associated archaeology and histories and their temporo-spatial context) and taphonomy (represented by evidence for the post-mortem environment up until the point of analysis).

The session encompasses case, group and population studies, and a variety of grave forms and assemblages from single individuals to mass graves to disparate collections, considering not only the evidence for past physical violence (incorporating evidence for warfare, domestic violence, ritual violence, ancient crime and punishment), but also wider manifestations of violence in society throughout the past and the present (e.g. the structural violence sometimes associated with curated human remains).

The session is focussed on, but not limited to, human remains from any archaeological context. Presenters are actively encouraged to critically evaluate their own cases of violence encountered in the bioarchaeological record, to explore alternative explanations and examine the potential influence misinterpretations might have upon the broader context into which their cases and results might be drawn.

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ABSTRACTS

SKELETAL TRAUMA AND TAPHONOMY: NAVIGATING COMMON PITFALLS AND COMPLEX CHALLENGES

**Abstract author(s):** Meyer, Christian (OsteoARC - OsteoArchaeological Research Centre)

**Abstract format:** Oral

Trauma is one of the most prominent features of bioarchaeological research and is quite often highlighted in the interpretation and presentation of archaeological burials. Although skeletal trauma as such is comparatively easy to identify macroscopically, it some-times poses a challenge to correctly assess the actual timing of injury in relation to the complex triad of death, burial and decay. Dif-ferentiating between trauma that occurred antemortem (showing signs of healing), peri-mortem (no signs of healing and potentially lethal) or post-mortem (thereby taphonomic in nature) is one of the key assessments that can shape subsequent archaeological narratives. If traumatic lesions are misjudged faulty interpretations might follow which - having entered the scientific or popular lit-erature – might not be revisited for quite some time. Using extant examples from various archaeological sites this presentation aims to provide an overview of some of the aspects that complicate the bioarchaeological interpretation of burial features, of the skeletal
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remains found within and – mainly – of their traumatic lesions. As graves and their content are not static over time it is truly essential to be aware of the multitude of anthropogenic and non-anthropogenic factors that can and likely will have altered the assemblage at hand. Carnivore and rodent gnawing, root etching, rare anatomical variants, grave reopening (accidental or intentional), embedded projectiles, peculiar grave architecture etc. are just a few of the most common phenomena that can pose serious interpretative challenges when assessing skeletal trauma. In navigating these pitfalls diachronic contextual awareness is key and needs to be actively pursued in any serious scientific interpretation.

2 **AN ENEOLITHIC MASS GRAVE FROM ALBA IULIA-LUMEA NOUA (ROMANIA): PERIMORTEM BLUNT FORCE TRAUMA AS EVIDENCE FOR A VIOLENT EVENT?**

**Abstract author(s):** Gligor, Mihai - Fetcu, Ana (1 Decembrie 1918 University of Alba Iulia) - Bintintan, Alina (Independent researcher)

**Abstract format:** Oral

The interment of multiple bodies in a grave, as part of the same depositional event, is a common funerary discovery within the Neolithic and Eneolithic settlement at Alba Iulia–Lumea Noua (Transylvania, Romania). During the archaeological campaigns from the past 15 years, at least five pits containing commingled human remains have been excavated, raising the MNI to approximately 130.

The aim of this paper is to bring forth the most recent unearthing of a mass grave (Trench II/2019), where the remains of 11 individuals (six males, three females and two non-adult individuals) were discovered. Perimortem blunt force trauma injuries were observed on the skull caps of six of these individuals. The archaeological context revealed discrepancies between the individuals buried first in the pit and the ones that were buried on top of them. This can either be a result of natural taphonomical agents or differential treatment towards the dead.

C14 data for this funerary discovery offered a timeframe between 4500-4370 BC.

3 **TRAUMA OR TAPHONOMY?**

**Abstract author(s):** Mollerup, Lene (Museum Skanderborg)

**Abstract format:** Oral

An Iron Age human bone assemblage from a Danish site shows bone modifications in the form of antemortem trauma, peri-mortem trauma and post-mortem modifications. The bones come from the Alken Enge site, a wetland deposition of disarticulated human remains, predominantly young adult males, dating to the first century AD. The antemortem trauma consists mainly of broken and healed limb bones whereas perimortem trauma includes sharp force trauma, blunt force trauma and penetrating trauma. In the category of postmortem modifications, two types are present: human-induced bone modifications, in form of cut- and chop marks, most likely with the purpose of separating body parts; and taphonomic traces in the form of gnaw marks from scavenging animals.

A group of long bones with fresh spiral fractures challenged the investigators: was the bone breakage inflicted in battle, caused by scavenging animals or did it have a ritual dimension? Various suggestions concerning the nature of the bone breakage were considered, knowing that the outcome would affect the archaeological interpretation of the site. This paper presents the anthropological dilemma in distinguishing between trauma or taphonomy.

4 **VIOLENCE IN THE STEPPE: PATTERNS OF PERIMORTEM TRAUMA AT TUNNUG1 (SOUTHERN SIBERIA, 2ND-4TH C. AD)**

**Abstract author(s):** Milella, Marco (Department of Physical Anthropology - Institute of Forensic Medicine, University of Bern) - Caspari, Gino (Department of Archaeology, University of Sydney; Institute of Archaeological Sciences, University of Bern) - Kapinus, Yulija (Volga-Ural Center for Paleoanthropological Research SSSPU) - Blochin, Jegor - Sadykov, Timur - Malyutina, Anna (Institute for the History of Material Culture, Russian Academy of Sciences, St. Petersburg) - Keller, Marcel (Institute of Genomics, University of Tartu) - Schlager, Stefan (Albert-Ludwigs-Universität Freiburg · Department of Biological Anthropology) - Alterauge, Amelie (Department of Physical Anthropology - Institute of Forensic Medicine -University of Bern) - Lösch, Sandra (Department of Physical Anthropology - Institute of Forensic Medicine -University of Bern)

**Abstract format:** Oral

Warfare is assumed to be one of the defining cultural characteristics of steppe nomads in Eastern Eurasia, with high levels of violence used by Classical and Chinese historiographers as markers of cultural “otherness” when describing these societies. Especially for the first centuries AD, these interpretive biases hamper more nuanced reconstructions of the actual role played by violence in these communities. Here we present a study of perimortem trauma in a skeletal sample from Tunnug 1 (Tuva, Southern Siberia – 2nd-4th c. AD). Analysis of trauma at the site is used to address the following research questions: a) which type of trauma are more frequent in the sample? b) which demographic distribution characterizes the observed evidence? Presence of trauma was checked macroscopically and microscopically on 87 individuals representing both sexes and different age classes (N= 24 males, 14 females, 49 subadults). Patterns by age and sex were tested by means of logistic models and Fisher’s exact test. Perimortem trauma were identified on 22 individuals, mostly in the form of chop marks on the cranium and vertebral column and smaller cutmarks, mostly at the level of first cervical vertebrae and the cranial vault. Males are more exposed to trauma, whereas age differences are only present between adults (more trauma) and subadults (especially neonates and infants). Chop marks appear produced by a big blad-

ed weapon/s in the context of hand-to hand combat. Cut marks seem rather the result of throat slitting and scalping by means of smaller implements. Our results indicate high levels of violence, with overkill, executions and trophy taking being integral parts of aggressive behaviors at Tunnug1. At the same time, clear demographic patterns in trauma distribution suggest that violent confrontations were not indiscriminate but probably resulted from complex social and economic triggers.

5 **VIOLENCE AND ITS ROLE IN DEATH PROCESSES: A CONTEXTUAL BIOARCHAEOLOGICAL AND MORTUARY ANALYSIS OF DECAPITATION BURIALS IN WESTERN ROMAN BRITAIN**

**Abstract author(s):** Christie, Shaheen (University of Wisconsin-Milwaukee)

**Abstract format:** Oral

The complexity of violence in the Roman world may be examined on multiple scales (personal, relationship, community, and societal) using a broad range of evidence, including: documents, cultural materials, funerary and mortuary evidence, as well as skeletal remains. Our understanding of the prevalence of violence and its role in society is directly influenced by the evidence available, those cultural practices which may skew those data, and methods of recovery and interpretation by archaeologists. Studies with multiple scales of analysis published over the past twenty years have made it possible to reexamine the role of different types of violence (lethal and non-) and its scale temporally and spatially. This project seeks to further understand the intersecting relationships between violence, ritual, bodies, and memory by presenting a contextual bioarchaeological and mortuary analysis of 117 total inhumation decapitation burials from 42 sites in western Roman Britain during the Late Roman Period (3rd – 5th cent. AD). Previous studies show decapitation was enforced both pre- and post-mortem on individuals of all ages, sex, origin, health and stature for diverse reasons (infanticide, judicial execution, trophy taking, fear of the dead, veneration, or an “outsider” social status) as part of a sub-class of mortuary treatment meant to potentially express communal membership. It is hoped by utilizing a systematic approach in this analysis, with particular emphasis on the inclusion of trauma and taphonomic evidence, that the results will reveal whether decapitation and its associated mortuary practices were applied to signify individualized or community identity within or outside of funerary contexts, and if violence was used selectively to manipulate and transform the structural process of death over time then what might we infer about those individuals and their relationships with the community and society in Late Roman Britain.

6 **A STUDY IN SCARLET: INTERROGATING THE EVIDENCE FOR PERI-MORTEM TRAUMA IN MASS GRAVE DEPOSITS FROM CRUSADER PERIOD SIDON, LEBANON**

**Abstract author(s):** Mikulski, Richard (Bournemouth University)

**Abstract format:** Oral

Recent reports have noted the presence of distinctive patterns of peri-mortem trauma and/or unusual treatment of human remains associated with conflict, suggesting interpretations of overkill (Geber, 2015), denigration of the body (Appleby et al., 2015) or ritualistic behaviour (Holst et al., 2018). Crusader period mass grave deposits (MNI = 25) excavated at College Site, Sidon indicate a deliberate and organised attempt to deal with the consequences of a major violent conflict in the mid-13th century. Whilst the evidence for multiple peri-mortem sharp force traumata in multiple individuals is clear and consistent with inter-group warfare, the evidence for blunt force trauma associated with such conflict is less robust, especially given the evidence for the immediate taphonomic history of the skeletal remains. Using this case study, drawing together the indisputable sharp force trauma, the more ambiguous evidence for blunt force injuries and the taphonomic processes following death, this paper seeks to highlight the subtleties of some of the skeletal modifications under consideration, the problems of interpretation, and potential approaches to combining different forms of evidence to strengthen interpretation of the processes encompassing death, deposition and subsequent treatment of remains.

7 **BREAKING WITH TRADITION: REVISING FINER POINTS OF TERMINOLOGY IN TRAUMA ANALYSIS**

**Abstract author(s):** Tamminen, Heather (Bournemouth University)

**Abstract format:** Oral

Trauma analysis has long been a topic that interests both osteoarchaeologists and forensic anthropologists. Conventional methods of manual measurement and sometimes microscopic imaging have been used to record instances of trauma, specifically sharp force trauma, but at times it remains an imprecise science. In particular, this paper explores the need for new terminology surrounding fracturing that arises from sharp force trauma. This revision to terminology was prompted by the study of approximately 50 decapitated individuals found in a mass grave on the South Dorset Ridgeway (UK) in 2009. These remains have been radiocarbon dated to the 10th century AD and found to be of Scandinavian origin based on isotopic signatures. The majority display sharp force trauma to the neck and mandible consistent with violent decapitation in addition to other weapon injuries indicative of conflict prior to being executed. Further examination of the collection using modern digital technology is on-going to understand the trauma as comprehensively as possible. During this investigation, it has become apparent that the length of incised cutmarks can be over-estimated because in some instances the cut transitions into a fracture. A new term to represent these fractures is suggested; Residual Energy Dispersal (RED) fractures. The mechanism of this fracturing is still under investigation however it likely involves some combination of factors including the nature and biomechanics of bone, the force of the blow and form of the blade, the method of blade removal, and taphonomic alterations that occur with the drying of the bone. The ability to differentiate fracturing, RED or otherwise, from sharp force trauma is paramount in interpreting the events that may have occurred.



8 **TRAUMA ON MEDIEVAL SCOTTISH SKELETONS: WHAT WE WANT TO SEE OVER WHAT WE CAN SAY**

**Abstract author(s):** Chaumont Sturtevant, Elisabeth (University of Aberdeen)

**Abstract format:** Oral

Violence is a recurring theme in the study of human behaviour, it is recognized as an integral part of culture and society. The studies on violence vary between clinical, cultural and political frameworks.

Between 1980 and 1994, excavations at “the Green”, a Medieval Carmelite friary burial site in Aberdeen, uncovered 201 burials. This new research has provided the opportunity to focus on a sub-set of specific individuals from the site to consider the involvement of interpersonal violence (IPV), re-examining nine individuals with multiple traumata. One individual stood out during this work due to two peri-mortem injuries caused by sharp force trauma. However, for the majority of lesions, interpretation was not as straightforward. Such was the case with three older males who suffered multiple lesions. These injuries could be associated either with accidental trauma or with IPV.

New technologies have helped to reassess past diagnoses. Such was the case with a disarticulated older male skull. This older male presented a large smooth circular depression on the left side of the frontal bone. When the skull was first analysed, the depression was thought to have been a very well healed injury caused by sharp force. A CT scan was conducted and identified no fracture but a thinning of the cortex possibly due to a benign tumour.

The study of these individuals may reflect how past injuries are understood as well as the limitations in bioarchaeology. This presentation shows how research questions can create a bias in how acts of violence are recognized. It emphasizes the importance of differential diagnoses and finally, it restates the importance of revisiting museum collections as more disciplines evolve, allowing more insight into the past.

9 **16TH-17TH-CENTURY WAR-RELATED GRAVES AT THE VASTSELIINA BOROUGH CEMETERY, ESTONIA  
MARTIN MALVE, UNIVERSITY OF TARTU, ESTONIA**

**Abstract author(s):** Malve, Martin (University of Tartu, Institute of History and Archaeology, Department of Archaeology)

**Abstract format:** Oral

Archaeological rescue excavations at the Vastseliina borough cemetery took place in connection to the building of the Pilgrim Hall of the medieval theme park at Vastseliina Castle. During the rescue excavations 143 burials were documented. The analysed sample from Vastseliina borough cemetery consisted of 99 adults and 44 subadults. Four mass graves containing a total of 31 individuals were discovered in the cemetery. Graves with several individuals are rare in Estonian rural cemeteries and churchyards.

Mass grave no. 1 consisted of six individuals: three males, two females, and one juvenile. All skeletons were placed in a supine-extended position, but in a non-regular manner – hands and legs were criss-cross over others and the bodies were atop each other. The irregular positions indicate that the deceased had been thrown in the grave. Based on finds, this mass grave dates either from the second half of the 16th or the early 17th century. Five skeletons in mass grave no. 1 showed evidence of sharp force traumata, demonstrating at least 38 cut wounds altogether. During the osteological examination, five skeletons had at least 38 cut wounds altogether. Most of the wounds were located on the top of the cranium. In addition to the mass grave and a double burial, two males who died as a result of violence were found. Among the commingled remains two skulls with peri-mortem cut marks were also found.

The discovery in Vastseliina is the third known mass grave of victims of violence and the first mass grave dated to the Early Modern Period. Since during the 16th and 17th century Livonia was an active battle ground, it is not possible to determine exactly when the people met their deaths’.

10 **POSTMORTEM FATE OF KL STUTTHOF VICTIMS (1939-1940)- THE HUMAN REMAINS’ BURIAL AND  
STORAGE CONDITIONS INFLUENCE ON THE TRAUMA RESULTS ANALYSIS**

**Abstract author(s):** Drath, Joanna - Arciszewska, Joanna - Cytacka, Sandra (Pomeranian Medical University) - Machalski, Grzegorz - Holicki, Mariusz (West Pomeranian Oncology Center) - Parafiniuk, Mirosław - Ossowski, Andrzej (Pomeranian Medical University)

**Abstract format:** Oral

The Stutthof concentration camp, which was situated within the Free City of Danzig district, had already been established before World War 2 broke out in relation to the ethnic cleansing project that included the liquidation of Polish elites (members of intelligentsia, religious and political leaders) in the Danzig area and Western Prussia. According to historical records, between October 1939 and March 1940 eighty-nine people were executed in a nearby forest around 2 km from the camp and buried in two large mass graves. Two stages of exhumations took place after the war: the first one in 1946 and the latter in 1979. The remains of the people who were not identified were put commingled in two sarcophaguses and placed in a crypt under a monument that was erected as a part of a memorial museum. The skeletons laid under the monument until 2018 when they were exhumed again and transported to Forensic Genetics Department of Pomeranian Medical University for analysis leading to the identification of the victims. While performing skeletal examination, scientists had to consider all the various taphonomic agents that affected bodies during decomposition and the diagenetic process. Macroscopic and radiological methods were employed in our research to establish time, type, place and sequence of each perimortem lesion on cranial and postcranial elements. The results show that out of thirty-three examined skulls sixteen have no injuries, nine manifest blunt force traumas (four of them with multiple injuries), eight show gunshot traumas

(two of them have more than one injury), one skull manifests multiple blunt force trauma and a gunshot injury, and one skull was too damaged for trauma analysis.

Trauma analysis is a crucial step in forensic investigations, therefore, it is necessary that anthropologists consider the burial environment before making the final diagnosis regarding this matter.

a. **LETHAL VIOLENCE OR VIOLENT RITUALS DURING THE IRON AGE? A CROSS-DISCIPLINARY  
BIOARCHAEOLOGICAL AND TAPHONOMIC ANALYSIS OF A CANTABRIAN SKULL**

**Abstract author(s):** Camarós, Edgard (Universidad de Cantabria) - Carnicero, Silvia (Instituto de Medicina Legal) - Cabanzón, Alba (Universidad de Cantabria) - Reyes-Centeno, Hugo - Göldner, Dominik (University of Tübingen) - Vallejo-Llano, Jorge (Universidad de Cantabria) - Pereda, Eva (Museo de Prehistoria y Arqueología de Cantabria) - Bolado, Rafael - Arias, Pablo (Universidad de Cantabria)

**Abstract format:** Poster

The Iron Age has been indicated as a period of high sociopolitical instability, resulting in different violent conflicts. Furthermore, the evidence of violent rituals, specifically those associated with cranial modifications (e.g., skull trophy, decapitations, etc.), has focused the research agenda towards the search of bioarchaeological evidence of violence (i.e., bony lesions). Nevertheless, the gap between skeletal trauma and the archaeological contexts is not always explored, resulting in a misinterpretation of the social dimension. In the present contribution, we analyze an adult female cranium dated to the 4th century BC from Las Rabas Hillfort (Cantabrian Spain), with evidence of lethal cranial trauma. The results of the bioarchaeological and taphonomic analysis are contextualized with the archaeological record, and interpretations relating to the violence evidenced are discussed. Our cross-disciplinary perspective which bridges the gap between the cranial trauma and the archaeological contexts has implemented an experimental approach, incorporating 3D scanning and printing, virtual morphometry and forensic anthropology.

b. **SKELETAL TRAUMA OR POST-MORTEM DAMAGE? EXPLORING THE ROLE OF TAPHONOMY IN A  
PREHISTORIC SKULL FROM ERIMI LAONIN TOU PORAKOU (CYPRUS)**

**Abstract author(s):** Monaco, Martina (Dept. of Archaeology, University of Sheffield) - Riccomi, Giulia (Division of Paleopathology, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa) - Tripodi, Paolo (Independent Research) - Aringhieri, Giacomo (Diagnostic and Interventional Radiology, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa) - Bombardieri, Luca (Dip. di Studi Umanistici, University of Turin)

**Abstract format:** Poster

The interpretation of the taphonomic effects on the human skeletal remains does not have rigidly defined procedures. Instead, it is essentially based on the evaluation of the archaeological context in which the osteological assemblage is deposited and on the analysis of the extrinsic (e.g. weathering, soil acidity) and intrinsic (e.g. sex, age, mineral density of bones) variables. A comprehensive understanding of its impact on bone preservation is particularly significant when dealing with human skeletal remains coming from prehistoric contexts. With this regard, we present skeletal evidence of a possible trauma from the prehistoric site of Erimi-Laonin tou Porakou (southern Cyprus). The site represents one of the major Middle Bronze Age (c. 1960-1650 BC) communities of the island primarily devoted to textile activities as suggested by the presence of a well-organized workshop complex (Area A). Recent excavation in one of the residential units of the domestic quarter, south-located with respect to the workshop complex, has revealed an anomalous intramural burial of a young female individual. The skull, in poor state of preservation, exhibited near the occipitomastoid suture a diamond-shaped bone defect, measuring approximately 10x0.7mm. Taphonomic alterations heavily impacted the margins of the lesion, so that the distinction between peri-mortem lesion or post-mortem bone loss was a challenging evaluation. Macroscopic observation was followed by imaging (CT scan) in order to explore potential explanations that include the hypotheses of traumatic lesion and post depositional breakage. The post depositional processes in prehistoric sites, such as that of Cyprus, variably influence the quality of the osteological material and hinder the final evaluation of bone lesions. For this reason, the bioarchaeological investigation of injury and trauma in contexts where the taphonomy has a relevant role, requires a critical attitude in order to be conscious of the obstacles and interpretative limits.

c. **A BIOARCHAEOLOGICAL STUDY OF DECAPITATION FROM LATE BYZANTINE (13TH-14TH CENTURY)  
THESPROTIA, GREECE**

**Abstract author(s):** Aidonis, Asterios - Papageorgopoulou, Christina (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace)

**Abstract format:** Poster

Violence is a structural element of human history and in different forms, played a significant role in past societies. Manifestations of violence on human skeletal remains can reveal culturally specific patterns through the accurate study of type and distribution of injuries. Taphonomy is also crucial for the correct interpretation of the available data. We present here a case study of human decapitation, dated to the Late Byzantine period (13th-14th century AD) from the archaeological site of Doliani, Thesprotia, North Western Greece. The skeleton, in an excellent state of preservation, belongs to a young male of about 20 years and shows multiple sharp force injuries. Cut marks have been detected on the first three cervical vertebrae, the skull and the mandible, as well as in the right forearm and both scapulae. Extensive areas with active periostitis lesions were also observed in different skeletal regions. We

d.

VAMPIRE OR VICTIM? EXAMINING A CASE OF BLUNT FORCE TRAUMA IN AN OTTOMAN SKELETON FROM NESSEBAR, BULGARIA

Abstract author(s): De Pace, Monique (University of Edinburgh)

Abstract format: Poster

During excavations of the Medieval Church of Sts Michael and Gabriel in Nessebar, Bulgaria, the skeleton of an Ottoman (16th– 18th century) individual was discovered with a large iron nail driven through their chest, giving the individual the moniker of “vampire”. This individual, SMG 22, sustained multiple massive blunt force cranial injuries that likely caused death almost immediately. The osteo-logical analysis indicates that this individual was likely a scapegoat for the town at a time where political change and social anxiety were rampant. The level of “overkill” that SMG 22 had inflicted upon their person could be suggestive of an extreme response to factors beyond human control. The existence of a vampire folkloric belief has been recorded from ancient Greece and Rome up to the Byzantine Empire and in Greek Orthodox precepts. Many of the classic symptoms that identify an individual as a vampire can be explained, however, through an understanding of disease and the taphonomic conditions that can affect a decomposing corpse. The conditions of SMG 22’s burial and the pathological changes identified upon the skeletal remains, along with an isotopic reconstruc-tion of the individual’s diet during life will be used to understand the circumstances surrounding their violent death.

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NOVEL CROSS-DISCIPLINARY APPROACHES IN BIOARCHAEOLOGY

Theme: 5. Theories and methods in archaeology: interactions between disciplines

Organisers: Wärmländer, Sebastian (Division of Biophysics, Stockholm University; UCLA/Getty Conservation Programme, Cot-sen Institute of Archaeology, UCLA, Los Angeles) - Šarkić, Nataša (Universidad Autonoma de Madrid, Facultad de Ciencias, Edifi-cio de Biología)

Format: Regular session

Technological improvements during the last decades have provided bioarchaeologists with numerous new techniques for analysis of skeletal remains and other bioarchaeological material. This includes analysis of biomolecules such as proteins, DNA, and hormones, stable isotopes and trace elements, 3D-scanning, and various digital morphometrics approaches. While such techniques increase the scope of archaeological information that can be obtained from bioarchaeological samples, the most interesting bioarchaeologi-cal research is often obtained when two or more approaches are combined. This typically requires different specialists to meet and collaborate – i.e. networking among researchers.

To promote such networking as well as the dissemination of novel research methods, in this session we welcome papers on bi-oarchaeology where two or more researchers collaborate by using different methods or approaches to study the same material. Although the studied research material can be from any time period or geographic region, at least one of the techniques (analytical method, theoretical framework, social perspective, et cetera) used to investigate the material should be relatively novel, in the sense that it has not yet become a “mainstream” technique. Furthermore, we encourage young researchers to present their work.

ABSTRACTS

1

POVERTY, CHASTITY AND... OBESITY? ANTHROPOLOGICAL, PALEOPATHOLOGICAL AND ISOTOPIC ANALYSIS OF THE COMMUNITY OF THE MONASTERY OF SAN JERÓNIMO EL REAL

Abstract author(s): Sarkic, Natasa (OSTEO Research) - Grandal, Aurora (Instituto Universitario de Xeoloxía, Universidade da Coruña ESCI) - Garcia, Ana (ArchaeoScience#RO Platform, Research Institute of the University of Bucharest - ICUB) - Becerra, Paula (Consejo Superior de Investigaciones Científicas - CSIC) - Borrella, Sara - Herrérin, Jesus (Facultad de Biología, Universidad Autónoma de Madrid)

Abstract format: Oral

Introduction: The old monastery of San Jerónimo el Real (XVI-XX century) was one of the most important monasteries in Madrid, initially governed by the Order of San Jerónimo. The convent was closely linked to the life of the Court and the Spanish monarchy and was the venue for royal weddings and coronations. In 1998, the Cloister of the old convent was excavated, and that space was annexed to the Prado Museum.

Material and methods: The analysis of the material exhumed in the monastery of San Jerónimo (Madrid) includes 22 individual graves and 5 secondary burials and ossuaries. An anthropological, paleopathological and isotopic analysis of the remains was carried out.

Results: All individuals, whose sex and age was possible to estimate, were adult men. Numerous differences have been observed

between them, both in their robustness and in the stress markers but, surprisingly, also in their diet. In the case of a religious com-munity, which theoretically should have had a homogeneous diet (the same foods and in the same quantities) and with religious restrictions (fasting), the isotopic results show significant differences between individuals. Several infectious diseases were also noted, among which a possible case of syphilis (sexually transmitted disease).

Conclusions: These results show that there were considerable differences in the monastery in the way of life between the individ-uals that formed that religious community and that, in some cases, seems to indicate that the vows were not fully respected. It is possible that the proximity to the Crown could have granted those monks higher privileges and freedoms, as well as permission to avoid strict rules of the order.

2

TRIALS AND TRIBULATIONS: NORWEGIAN WORKHOUSE INMATES FROM SENTENCING TO CEMETERY

Abstract author(s): Drew, Rose (Department of Archaeology, University of Winchester; University of Oslo) - Madden, Gwyn (An-thropology Department, Grand Valley State University) - Schuenemann, Verena (Institute of Evolutionary Medicine University of Zurich) - Alvestad, Karl (Department of Culture, Religion and Social Studies, University of Southeastern Norway) - Naumann, Elise (Archaeological Researcher Norwegian Institute for Cultural Studies - NIKU)

Abstract format: Oral

This paper highlights cross-field examinations of an Oslo workhouse, Tukthuset (1741-1938). An associated cemetery, in use from ~1760 to 1820, was cleared in 1989 by archaeologists and untrained road workers; about 50 graves were previously removed in the 1930s. The minimum number of individuals is 310; with one-third fairly complete. Hundreds of elements are sawn, consistent with use of cadavers for anatomical research and surgical training. Chronic infections such as TB and syphilis are observed, with TB cited in burial records as a common cause of death among inmates.

The study encompasses translations of magistrate trials and workhouse archival documents, historical research, genealogical in-vestigation, biomolecular studies including stable isotope and aDNA, and anthropological study of the skeletal remains. An Oslo resident has traced a direct ancestor to the workhouse cemetery, locating both his name in burial archives, and the actual magis-trate’s trial that sentenced him and his wife to Tukthuset. An historian is working through 200-year-old documents to ascertain what inmates ate, wore, were forced to do for labor, and is producing the first English and modern Norwegian translations of these records. Anthropological observations have been completed for all remains and are being analysed. Stable isotopic studies will investigate if the workhouse residents were undernourished, and if they were immigrants. As recent advances in the field of ancient DNA and sequencing technologies have revolutionized our understanding of the evolution of pathogens, we plan to include these techniques to look to pathogens, for which we have osteological indications including TB and syphilis. The combination of all of these fields in one project celebrates and exemplifies cross-disciplinary research.

3

A CASE OF AMYOTROPHIC LATERAL SCLEROSIS AFTER EXPOSURE TO MANGANESE FROM TRADITIONAL MEDICINE PROCEDURES IN KENYA

Abstract author(s): Wärmländer, Sebastian (Division of Biophysics, Arrhenius Laboratories, Stockholm University) - Roos, Elin (Department of Global Public Health, Karolinska Institutet) - Meyer, Jeremy (Unit for Surgical Research, Medical School of Geneva, University of Geneva) - Sholts, Sabrina (Department of Anthropology, National Museum of Natural History, Smithsonian Institu-tion) - Roos, Per (Institute of Environmental Medicine, Karolinska Institutet)

Abstract format: Oral

Amyotrophic lateral sclerosis (ALS) is an always fatal neurodegenerative disease of unknown cause characterized by motor neu-ron loss and widespread muscular atrophy. The cause of ALS is unknown, although genetic and environmental factors have been intensely investigated. Recent data suggest a role for metal exposures in ALS causation. In this study we present a patient who developed ALS after insertion of a black glistening metal powder into lumbar subcutaneous cuts as part of a traditional medicine procedure in Kenya. Four months after the treatment, general muscle weakness developed, and clinical and electrophysiological examinations detected widespread denervation consistent with ALS. The patient died from respiratory failure less than a year after the exposure. Scanning electron microscopy and X-ray diffraction analyses identified the black powder as potassium permanganate (KMnO4). A causative relationship between the systemic exposure to KMnO4 and ALS development can be suspected, especially as manganese is a well-known neurotoxicant previously found to be elevated in cerebrospinal fluid from ALS patients. Manganese neurotoxicity and exposure routes conveying this toxicity deserve further attention, as do the procedures involved in African tradi-tional medicine.

4

ASSESSMENT OF CELLULOSIC-BASED PRINTING AND GRAPHIC ARTS SUBSTRATES OF KNOWN ORIGIN AND AGE VIA RESONANT CAVITY DIELECTRIC SPECTROSCOPY

Abstract author(s): Kombolias, Mary (National Institute of Standards and Technology; United States Government Publishing Office) - Gandomirouzbahani, Mastaneh - Obrzut, Jan - Obeng, Yaw (National Institute of Standards and Technology)

Abstract format: Oral

Dielectric spectroscopy is a powerful analytical tool which utilizes the response of individual molecules to microwaves, providing simultaneous chemical and structural information. It widely used to evaluate modern-day materials in the semiconductor industry. We have adapted dielectric spectroscopy with the use of a resonant cavity to enable contactless, non-destructive, quantitative



5

## EVOLUTION OF CROPS AND LIVESTOCK BREEDS IN THE NORTH-WESTERN MEDITERRANEAN IN THE PAST 8 MILLENNIA : THE DEMETER PROJECT

**Abstract author(s):** Ros, Jerome - Evin, Allowen - Bouby, Laurent (CNRS, UMR5554)

**Abstract format:** Oral

The DEMETER project, started in March 2020, aims to trace the evolution of crops and livestock breeds under different agricultural and environmental regimes and in different socio-economic contexts, since the beginning of agriculture. More specifically, the questions raised in the framework of DEMETER are: how has agrobiodiversity evolved through time and space? What factors (e.g. socio-economical, environmental) have influenced its evolution? According to what modalities? DEMETER aims to study a selection of animal and plant models: pig, sheep, goat and barley, in a restricted geographical area corresponding to the North-Western part of the western Mediterranean basin (Catalonia and southern France) from the Neolithic period to the present day. DEMETER relies on a new and original combination of approaches, including phenomenics (through geometric morphometrics), database, archaeozoology, archaeobotany, climatic reconstructions, palaeoproteins (ZooMs) and statistical analyses, which will be used to jointly analyse a large number of archaeological remains (e.g. mammalian teeth and barley grains). For this presentation, the first results obtained will be presented.

a.

## DIGITISING THE DEAD: THE BENEFITS OF INTEGRATING 3D DIGITISATION INTO SKELETAL TRAUMA ANALYSIS

**Abstract author(s):** Tamminen, Heather (Bournemouth University)

**Abstract format:** Poster

The integration of different disciplines is becoming increasingly common in archaeology with substantial benefits to the analysis and interpretations of findings, with one such example being the use of digital three-dimensional (3D) visualisations. Human remains are occasionally digitised, however this can be an ethically sensitive subject. Work is required to test whether these models have utility for detailed analysis, allowing them to have more purpose than solely display or preservation. In 2009, a mass burial was discovered with evidence of violent events occurring prior to death. Isotopic signatures identified the individuals as having originated in Scandinavia and North-Eastern Europe and radiocarbon dating identified them as being from the 10th Century AD. Widespread sharp force injuries were found on them and whilst these injuries were recorded by conventional manual methods, there is more that has been revealed about their deaths, primarily due to advances in digital technology. The unique provenance of this collection made it an ideal case study to investigate the potential of Multi-View Stereo Structure-from-Motion photogrammetry to generate 3D visualisations of skeletal injuries which are of a high enough quality to study. Results currently suggest that the 3D models do provide detailed reproductions of the trauma, allowing it to be effectively analysed without risk of damaging the specimens. However, the question remains: why is this something researchers would want to spend time and energy doing whilst studying sharp force trauma? This poster strives to answer those questions and discuss how researchers can learn from other disciplines when analysing 3D data, why such models of sharp force trauma can increase our understanding of past peoples, and why this technique has the potential to be a fantastic resource for individuals studying trauma in both archaeological and forensic situations.

b.

## MULTIVARIATE APPROACH OF HUMAN SKULL MORPHOMETRY IN A BRONZE AGE GROUP FROM CÂNDEȘTI (ROMANIA)

**Abstract author(s):** Popovici, Mariana - Groza, Vasilica-Monica (Romanian Academy – Iași Branch, “O. Necrasov” Center of Anthropological Research) - Petraru, Ozana-Maria - Bejenaru, Luminița (Romanian Academy – Iași Branch, “O. Necrasov” Center of Anthropological Research; Faculty of Biology, “Alexandru Ioan Cuza” University of Iași)

**Abstract format:** Poster

To identify morphometric characteristics in a human group dating from Bronze Age (Monteoru Culture, 1550-1300 BC), more than 400 skeletons excavated from the necropolis of Cârdești (Vrancea County, Romania) were examined. Considering that the skull is most commonly skeletal part used in ancient population studies, in our work only craniofacial metric data were used. Multivariate analysis was focused on the skull indices (according to Martin and Saller, 1956-1966) that have shown accuracy and confidence in the description of typological characteristics in previous our studies: cranial index (8/1), basio-bregmatic longitudinal index (17/1), basio-bregmatic transversal index (17/8), porio-bregmatic longitudinal index (20/1), porio-bregmatic transversal index (20/8), gnathic index (40/5), total facial index (47/45), orbital index (52/51).

Principal Components Analysis, used as an exploratory tool, highlights the existence of variation models attributed to some ty-

pological groups. To evaluate the significance the main traits of difference in typological groups, multivariate analysis of variance (MANOVA) and Canonical Variates Analysis (CVA) were applied.

According to our results, the total facial index, the orbital index and the cranial index manifest the best discriminant functions to describe a skull typology, with an accuracy of 75%. Another finding is that the morphometrics of Mediterranean and Proto-European types are predominant in the Bronze Age human group from Cârdești. The presence of the Nordoid type morphometrics suggests that at least some of the individuals were assimilated and integrated by the main group of Monteoru Culture.

This work was supported by a research grant made with financial support from the Recurring Donor Fund, available to the Romanian Academy and managed by the “PATRIMONIUL” Foundation GAR-UM-2019-II-2.1-16.

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## THE RISE OF THE RELIGIOUS LANDSCAPE IN CARPATHIAN BASIN: THE ARCHAEOLOGY OF ROUND SHAPED CHURCHES AND THEIR EUROPEAN CONTEXT

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Organisers:** Szocs, Peter Levente (County Museum Satu Mare) - Istrate, Daniela Veronica (Vasile Pârvan Institute of Archaeology, Bucharest) - Čechura, Martin (Museum of West Bohemia)

**Format:** Regular session

Round churches represent one of the most important part of the medieval ecclesiastical landscape in Europe. Inspired by the architecture of the Holy Sepulcher and subsequently the imperial chapel in Aachen, this special architectural type has spread especially between the 9th and 13th centuries, but examples are not missing outside this time period. Round churches were built in very different contexts, over time with various functions: baptisteries, court/palace chapels (following the example of Aachen), funerary or cemetery chapels, ossuaries and, most frequently, parish churches (especially in Eastern Europe) – or a combination of the above.

Round churches were built all over Europe, both in territories of eastern and western Christianity, and represent the oldest church-building type in the Carpathian Basin: over 100 buildings being documented as having medieval origins. A lot of examples are known in Saxony, Poland, Bohemia, Moravia, Sweden, Norway and Denmark, too, staying at the beginning of Christianization and religious architecture.

Although much has been written on this subject, there are a number of issues that have not yet been resolved and require a deeper approach. In addition, in the last decades archaeological researches have brought much news on this topic, by discovering new objects and in-depth analysis of the phenomenon, which are not yet inserted in the context.

This session invites a debate on this topic, to explore the complex world of round churches from an archaeological perspective. There are a lot of questions to be answered regarding the circumstances of their life, the chronological and architectural frame, the funerary perspective or the network of building sites. Their sources of inspiration (Western or Eastern origin?), function and role in the process of Christianization may be some of the topics discussed, but any perspective will be welcome, especially a comparative approach at European level.

## ABSTRACTS

1

## ROUND CHURCHES IN CENTRAL EUROPE: SEARCHING FOR ORIGIN AND FUNCTION

**Abstract author(s):** Cechura, Martin (The Museum of West Bohemia, Pilsen)

**Abstract format:** Oral

Round churches are a typical and widespread construction type of early medieval architecture. They appeared in Central Europe as early as the 9th century (Great Moravia Empire) and were associated with the spread of Christianity to Central Europe. Since the beginning of the 20th century, great attention has been paid to the search for the origin of this type of building and the ways in which it has spread to Central Europe. However, the results are still unclear and unconvincing. Similarly, Czech round churches are considered an inspirational source for other regions, especially Poland. The popularity of this building type ends during the 13th century. However, it only returns once again in the late Middle Ages as a manifestation of the so-called Romanesque Renaissance. The article deals with the research of round churches in Central Europe. It investigates their geographical distribution, possible origin and reasons that led to the choice of this type of construction.

2

## ORIGINS OF ARCHITECTURAL TRADITIONS OF PRE-ROMANESQUE CENTRALLY-PLANNED CHURCHES IN BOHEMIA

**Abstract author(s):** Tomanova, Pavla (Institute of Archaeology of the CAS, Prague)

**Abstract format:** Oral

Centrally-planned churches represent a considerable part of the earliest church architecture in Bohemia. The erection of those churches is dated to the era of the early Czech state, i. e. the late 9th/ early 10th centuries. Thus, since 19th century, scholars interested in research on rise and Christianisation of the Czech state have been investigating and discussing origins of architectural traditions of centrally-planned churches in Bohemia. The discussion has traditionally considered two main directions of origin: East Francia, i. e. western direction, and Dalmatia-Adriatic region, i. e. eastern direction. However, the research topic has always been a



politically sensitive issue and the discussion has reflected not only the current state of research, but also some social political demands. Recently, in terms of my PhD research, I have conducted some new analyses. The analyses is based firstly on comprehensive catalogue of Pre-Romanesque centrally-planned churches in the traditionally discussed regions, secondly on the latest discoveries in Bohemia. This contribution presents both, the summary of the traditional discussion, and the latest results of my analyses.

3 CHURCHES WITH ROUND-SHAPED GROUND PLAN IN TRANSYLVANIA: REVIEW OF THEIR ROLE WITHIN THE LOCAL ECCLESIASTIC MILIEU

**Abstract author(s):** Istrate, Daniela Veronica (“Vasile Pârvan” Institute of Archaeology, Bucharest)

**Abstract format:** Oral

Round churches were relatively common in Europe during the 10th to 13th centuries and highly popular in the Kingdom of Hungary. In 1972, no less than eighty rotundas were inventoried on its territory. Of these, only three were known in Transylvania and its vicinities: in Pelișor, Geoagiu de Jos and Alba Iulia. In the last decades, this repertoire was substantially enlarged thanks to the contributions of archaeology and of the reinterpretation of existing buildings or ruins. It may thus speak of at least eleven round-shaped buildings of medieval origin, each of them representing a different case in terms of topography (layout and location on the site), context and even function and chronology. Most of such buildings were built in the territory which was colonised by German settlers in Southern Transylvania, one is located in the ecclesiastical centre of Alba Iulia, while others are scattered throughout the territory.

This paper reviews the rotundas from Transylvania, based on most recent archaeological data. The topic is approached from a complex view, discussing the churches within the architectural, social and artistic context of their emergence and function.

4 THE MEDIEVAL ROUND-SHAPED CHURCH OF CIUMBRUD/CSOMBORD (ALBA COUNTY, ROMANIA)

**Abstract author(s):** Szocs, Peter Levente (County Museum Satu Mare, Romania) - Sebastian, Belbe (County Museum Satu Mare; Babes-Bolyai University, Cluj-Napoca)

**Abstract format:** Oral

The present Calvinist church of Ciumbrud shows a typical architectural arrangement for a village-parish church of Gothic style. Though the unusual width of the southern side-nave and the decorations of the window frames created some suspicions on its chronology. The archaeological research in 2019, which preceded the restoration works on the building, revealed that the building is not medieval, but it is realized entirely at the turn of the 16th an 17th century, in accordance with the date indicated on the stucco decoration of the sanctuary vault: 1701. The addition of the southern and northern side naves and the western towers are even later: they were made at the beginning of the 20th century, Burials and several (Romanesque and Gothic) sculpted stones, recovered during the archaeological research, indicated, however, that a former church-building existed at the site. This was identified in the northern side-nave, and it proved to be a round shaped church, though its ground-plan arrangement it is a reconstruction, as even the foundations were destroyed by later buildings. The chronology of this round church can be established with due cautions, using the guidance offered by the stratigraphy and superpositions. In this sense, it is clear, that the round-church started its existence with the earliest phase of the burials, which can be dated with a coin minted by king Géza II of Hungary. The abandonment and demolition of the church it is not so clear, as the traces of these interventions were not kept. It can be implied, though that it existed until the end of the Middle Ages.

5 CHURCHES WITH FOUR-LOBED CENTRAL GROUND-PLAN ARRANGEMENT: THE CHURCH OF ODORHEIU SECUIESC

**Abstract author(s):** Dumitrache, Marianne (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart - Esslingen) - Istrate, Daniela Veronica (“Vasile Parvan” Institute of Archaeology, Bucharest)

**Abstract format:** Oral

A variation of the central type ground-plan arrangement are represented by churches with multiple apses. Such constructions emerge on the territory of the Kingdom of Hungary as early as the 10th century, however, they most likely belong to the period of Árpád dynasty. In Transylvania, several examples are known, the majority being more or less justifiably dated to the Middle Ages, based on archaeological excavations. The proposed poster shall focus on the example provided by the church at the margin of the town Odorheiu Secuiesc. The settlement was a market-town during the Middle Ages, being one of the most developed urban center in the the Székely Land. The church’s layout is composed of 4 lobes symmetrically distributed around a 3.4 m side square. Due to its structure, it was believed that the church is a Romanesque building of 13th century. This early dating was nonetheless questioned in the 1970’es, when in the foundation ditch, a 16th century coin was discovered. The unusual dating, ignored for a long time by specialists, has been recently confirmed by the new archaeological excavations. The poster shall briefly present the issue of these church types, synthesising hypotheses expressed based on archaeological and architectural data, by contrast with existing pre-suppositions.

6 THE ROUND CHURCH DISCOVERED ON PORUMBENII MARI (ROMANIA, HARGHITA COUNTY)

**Abstract author(s):** Sófalvi, András (Haáz Rezső Museum)

**Abstract format:** Oral

During this summer, in the course of excavations made in the medieval church of Porumbenii Mari (HU: Nagygámbfalva), remains of a round church were discovered underneath the gothic edifice.

The first church interior diameter was about 5,5-5,8 m, with a smaller sanctuary, the walls were made from stone and brick, based on stiff clay (foundation wall).

After the reveal of a grave contemporary with this church, having anthropomorphic pit, the radiocarbon dating determine construction of the rotunda to 12th century. The rotunda was standing until the beginning of 14th century, when the first gothic church was built.

The new discovery is very important with regard to the regional church architecture. The round church in Porumbenii Mari is the only arpadian rotunda in the Szeklerland (Eastern Transylvania).

479 CONSTRUCTIVE CONSERVATION: MAKING MONUMENTS USEFUL

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Darvill, Timothy (Bournemouth University) - Sutton, Robert (Cotswold Archaeology) - Hüglin, Sophie (University of Basel)

**Format:** Regular session

Looking after heritage assets whether as archaeological sites, ancient landscapes, or historic buildings is an increasingly challenging task. Public authorities do not have the capacity or resources to deal with more than a very small fraction of what we now know exists, and increasingly look for public value in what they support. Private bodies and individuals are under pressure to realize financial value from the places they own during the course of development and redevelopment. Conservation as the sustainable and ethically sound management and maintenance of heritage assets needs new and innovative approaches to match these challenges. One such approach is ‘constructive conservation’ which encourages positive, well-informed, collaborative engagements with heritage assets; a flexible process that helps people understand their historic environment and then use that perspective to manage change. Especially important is recognizing, protecting, drawing out, and enhancing the significance of historic places. Creativity is important too, especially in finding new uses for old places in order to give them a secure future.

This session aims to provide a forum in which to illustrate and discuss constructive conservation as an innovative paradigm in contemporary heritage management. Papers are invited on the emergence and development of the idea of constructive conservation; case studies of successful (or unsuccessful examples); and considerations of the ethical and legal implications of constructive conservation in various jurisdictions. It is hoped that the session will range widely, including contributions on buildings, monuments, and landscapes, or combinations of all three. Contributions relating to the fulfillment of one or more of the United Nation’s 17 Goals for Sustainable Development through constructive conservation would be especially welcome.

ABSTRACTS

1 CONSERVATION IN PERSPECTIVE

**Abstract author(s):** Darvill, Timothy (Bournemouth University)

**Abstract format:** Oral

The idea of conservation as a means of looking after elements of the cultural heritage and protecting them from undesirable changes emerged in the late nineteenth century. Since then there have been many twists and turns in the way conservation is understood and implemented. This paper will look briefly at the philosophical roots of conservationism, and consider the dynamic relationships that have shaped its application over the last century and a half. Special attention is given to the conflicting and evolving ideas inherent to conservation within the broader field of archaeological heritage management: simple site protection; the notion of ‘restoring as found’; the idea of fulsome restoration; and the emerging trend for constructive conservation in which selected elements identified through research and investigation become integrated within broader schemes of development and redevelopment. It is argued that making the past contribute to the present has been a strong theme within conservationism for many years, although what exactly those contributions might be is often contested and negotiated. In a world where emotional connections to place are seen as increasingly important, where the art of place-making is integrated with spatial planning and design, and interests in well-being, sustainability, and prosperity dominate social policy, how might constructive conservation keep up with changing demands?

2 OVERCOMING THE NATURE-CULTURE DIVIDE: COMPENSATORY MEASURES IN ARCHAEOLOGICAL HERITAGE MANAGEMENT

**Abstract author(s):** Hueglin, Sophie (European Association of Archaeologists; Newcastle University; University of Basel)

**Abstract format:** Oral

To reduce, avoid or offset the potential adverse environmental consequences of development the EU Environmental Impact Assessment (EIA) Directive mentions three mitigation measures: preventative, corrective and compensatory measures. The third and last resort in case of unavoidable impact – compensatory measures – so far have not been demanded by archaeologists as it seems to contradicts their conventional conservation concept. They think archaeological heritage should be protected and if that is not possible excavated or possibly relocated, but how could it be compensated?

To understand this better, we have to look at heritage policies and their extreme ends which could be called: the site-centered concept vs. the landscape concept. The site-centered concept would identify a site, classify it, put a fence around, restore and try to upkeep it. The landscape concept would describe a historic environment, characterize its elements, but involve the stakeholders of a specific planning process to evaluate it. In this latter concept heritage potentially is everywhere in the historic environment and could possibly even be (re-)created during a development through compensatory measures.

Using examples from Germany and all over Europe, I will demonstrate the weaknesses of the current practice of heritage protection and discuss alternatives including compensatory measures. Further, I will argue how archaeologists could profit from adopting strategies from nature preservation and especially also from constructive co-operation in planning and conservation processes.

3 CONSTRUCTIVE CONSERVATION: MODERN INFRASTRUCTURE AND THE HISTORIC ENVIRONMENT OF ENGLAND

**Abstract author(s):** Chadburn, Amanda (Historic England)

**Abstract format:** Oral

Infrastructure has been a key priority for recent UK governments, and a large number of new infrastructure projects are planned or are under construction in England. These include roads, railways, power stations, water infrastructure, wind farms, solar farms, flood defences and airport expansion. Yet this infrastructure is to be built within a country rich in archaeological remains, historic landscapes and built heritage, both on and off-shore. As the first country in the world to industrialize, some of England’s historic places are themselves older infrastructure sites such as canals and railway stations. Poorly-designed new infrastructure can damage historic places, but conversely, well-designed new infrastructure can dramatically improve them and add to a sense of place.

This paper will explore some examples of historic assets and well-designed modern infrastructure, showing how constructive conservation can work in practice. Arguably, these help meet one of the U.N’s 17 sustainable development goals - Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

4 THE PROTECTION AND MANAGEMENT PROGRAMME FOR KRZEMIONKI PREHISTORIC STRIPED FLINT MINING REGION - OPPORTUNITIES, PROBLEMS, SOLUTIONS

**Abstract author(s):** Byszewska, Agata (Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland)

**Abstract format:** Oral

In July 2019, the Krzemionki prehistoric striped flint mining region was inscribed on the UNESCO World Heritage List. The monument covers an area of 349.2 hectares and consists of four parts: the main mining field in Krzemionki Opatowskie, two smaller mining fields Borownia and Koryczna and a permanent settlement of prehistoric miners in Gawroniec, whose inhabitants processed the material obtained from the mine and then used it for commercial purposes. The inclusion on the UNESCO List is a great honour, but also a great responsibility. The protection and management of such a vast area requires the involvement and cooperation of many very different environments and an excellent organization. The aim is to develop positive and conscious cooperation between all parties - museum, local government institutions, associations and private individuals for the purpose of efficient and sustainable management of the historic area. The main issue is to convince and gain public support. A lot of work is required to present the inhabitants of the region what is the value of this heritage, its importance for the present and next generations. The protection of the archaeological heritage is usually associated with certain limitations. Particular emphasis should therefore be placed on demonstrating the historical value of these places and jointly developing ways of managing them. It is important to find common elements from past and present times. The inscribing on the UNESCO list of the three prehistoric mines in Krzemionki and element of settlement was due to the fact that more than 5 thousand years ago, all this functioned as one great system of mines and settlements. It would be particularly important to emphasize the tradition of the community. Programme of the protection and management of the area of archaeological sites requires specific legal solutions, commitment and cooperatation on many levels.

5 THE ARCHAEOLOGICAL AREAS OF PRAGUE CASTLE: A LABORATORY FOR THE DEVELOPMENT OF METHODS AND DOCUMENTATION IN HERITAGE PRESERVATION

**Abstract author(s):** Tomanova, Pavla - Herichova, Iva - Marikova-Kubkova, Jana (Institute of Archaeology of the CAS, Prague) - Stuchlikova, Eva - Valek, Jan (Institute of Theoretical and Applied Mechanics of the CAS)

**Abstract format:** Oral

Prague Castle houses nine areas containing archaeological heritage from the medieval and early modern periods. They were created between the 1920s and 1960s and each of them requires specific attention. Mostly these areas contain structures of limestone, sandstone, wood and the remains of terrain, such as earthen ramparts. None of these areas can be accessed by the public and all show specific micro-climatic conditions.

Based on regular monitoring, a new concept of diagnostics and care was processed in 2018. In collaboration with Institute of Theoretical and Applied Mechanics of the Czech Academy of Sciences and other institutions, we started to document the state and stability of the relics anew. The spread of wood-destroying fungi and their elimination represents an individual problem.

It appears that we have two possibilities if we want to sustain at least the current state: either to conserve the organic remains and thereby change their material substance and authenticity or to document them perfectly and cover them up with soil again. At the same time, we try to make these areas accessibly virtually in the internet.

6 OM HAIL! SOME STORIES ABOUT THE BASIC PROBLEM OF ARCHAEOLOGICAL WORK IN ASIA: CYCLICAL TIME VS. LINEAR NOTIONS OF TIME

**Abstract author(s):** Lange, Perry (Institut fuer Ur- und Fruehgeschichte Kiel)

**Abstract format:** Oral

What is a memorial, how authenticity is perceived and what meanings the concepts of linear and cyclical time perception have in this context, is of great importance for the understanding of cultural heritage in Europe and Asia.

Both time concepts have a direct impact on the perception of monument protection and cultural heritage.

The perception of time is shaped by two phenomena. First there is the very personal experience of a linear, continuous and consciously perceptible development, such as the changes in aging, growing up with their ”breaks” and ”new beginnings”. But time has always been perceived as a cyclical phenomenon in which changes are repeated with great constancy. Both phenomena, the linear time and the cyclical time, have accompanied mankind from their beginnings and are, in their complexity, decisive cultural catalysts for religious and philosophical questions - until today.

The practical work in Nepal has repeatedly and directly led to irritations in the communication between European and Nepalese experts, employees and institutions when it comes to the question of the value of historical material culture. One reason for these problems is the, in part, significantly different levels of meaning that are assigned to the concept of authenticity.

Why is something ”old” valuable when it can - with perfect craftsmanship copied - shine in new splendor - after all, when the ”spirit” of the place and not the object is the decisive factor for cultural value retention? And why should an object, space or artifact become more valuable if it is frozen and preserved exactly in its current state? The historical background for the different understanding of monuments in Asian and European consciousness could be explained in the previous chapter on the importance of the cultural influences of linear and cyclical time perception.

HOW TO PROMOTE INTER- AND TRANSDISCIPLINARITY IN MEDITERRANEAN ARCHAEOLOGY?

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Peters, Manuel J.H. (Politecnico di Torino, Italy; Universidade de Évora, ) - Rose, Thomas (Ben-Gurion University of the Negev, Be’er Sheva, Israel; Sapienza Università di Roma) - Fundurulic, Ana (Sapienza Università di Roma; Universidade de Évora) - Paladugu, Roshan (Universidade de Évora; Sapienza Università di Roma)

**Format:** Discussion session (with formal abstracts)

Although the intertwining of disciplines is not a new idea in Cultural Heritage studies, there were some major achievements over the past decades, including the establishment of new networks and connections between archaeology and various other disciplines, e.g. Geography, Computer Science, Natural Sciences, and Conservation Science. Since then, cross-disciplinary standard approaches for the treatment, analysis, and investigation of cultural heritage were established or at least significantly progressed.

Across the Mediterranean, regions have been traditionally connected by trade networks and ancient civilisations. Institutions active in the field of Mediterranean archaeology today have significant variations in their archaeological research traditions, which influences the analysis and potential further research. Nowadays, a more integrated scientific network develops across the Mediterranean, connecting various disciplines. However, when it comes to the combination of the different research traditions within one project, the question about their compatibility often still arises. Although inter- and especially transdisciplinarity could help to leave thinking in disciplinary ”boxes” behind, it often brings its own complications, especially when a shared understanding is lacking.

People trained in different disciplines at the same time can be considered as inter- or even transdisciplinary. They tend to think outside these ”boxes” and although they might not identify themselves as such, their background can turn them into ideal promoters

for the implementation of such concepts within institutions and projects.

This session welcomes people from all fields working in interconnecting disciplines, related to Mediterranean archaeology. They are invited to share their experiences and possible suggestions as the basis for the following discussion. During the discussion, we aim to identify obstacles in and aims towards the establishment of more inter- and transdisciplinarity in training and research. Only then, the full potential of collaborations between different institutions can be unleashed.

ABSTRACTS

1 PERSPECTIVES FOR BENEFICIARIES OF INTERDISCIPLINARY AND MULTICULTURAL EDUCATION IN CULTURAL HERITAGE SCIENCE

**Abstract author(s):** Fundurulic, Ana (Department of Environmental Biology, Sapienza University of Rome; HERCULES Laboratory, University of Évora) - Ortega-González, Alvaro (Independent researcher) - López Aceves, Judith (Independent researcher) - Bhat-tacharya, Sriradha (IRAMAT-CRP2A UMR 5060—CNRS - University of Bordeaux Montaigne, Maison de l’archéologie; HERCULES Laboratory, Department of Chemistry, University of Évora)

**Abstract format:** Oral

The European Educational system for Cultural Heritage offers many opportunities to study in interdisciplinary and multicultural environments. It is encouraged and promoted as an excellent opportunity to gain a multifaceted perspective, learn skills and gain professional connections, all of which are essential for future generations of Young Professionals who will apply their knowledge in private, governmental and research sectors connected to Cultural Heritage. One of such successful programs is the Erasmus Mundus Joint Master in ARChaeological MATerials Science (ARCHMAT EMJMD) designed to provide students with specialized skills in archaeology and analytical characterization of materials, within a Consortium of three European Universities – the University of Évora (Portugal), the Sapienza University of Rome (Italy) and the Aristotle University of Thessaloniki (Greece) – and several associated partners including several museums and research centers. The ARCHMAT EMJMD program has been continuously offered since 2013. The European Doctorate in Archaeological Materials Science (ED-ARCHMAT), building on foundations of successful collaborations, joins together nine universities and is funded by the European Unions’ Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement N.º 766311.

Despite the success of both these programs, a few questions must still be addressed. What are the profiles of young professionals formed in such a dynamic environment? Are their skills suitable and competitive in the Higher Education job market? What are their future perspectives and possible research career paths? The newly created Archaeological Materials Science Alumni Network connects, supports and promotes Young Professionals in the world of Cultural Heritage Science. It grew from ARCHMAT EMJMD and ED ARCHMAT educational programs as a response to the need of establishing a cross generational platform. Its main goal is future oriented, creating an engaging and independent forum, that will detect main challenges, monitor the efficacy and provide support for students and emerging professionals.

2 AGRICULTURAL STRATEGIES IN PHOENICIAN WESTERN IBERIA: THE CASE STUDY OF CASTRO MARIM

**Abstract author(s):** Paladugu, Roshan (Universidade de Évora; Sapienza University of Rome) - Barrocas Dias, Cristina (University of Evora) - Arruda, Ana (University of Lisbon) - Magri, Donatella (Sapienza University of Rome) - Di Rita, Federico (Sapienza University of Rome)

**Abstract format:** Oral

With the current climate change crisis, agricultural strategies and land management have become centers of attention and scientific investigation. Archaeologists and scientists are contributing to the debate by providing scholars, policy makers, and development specialists with the necessary past examples. Many of their researches are oriented towards understanding how a diverse range of subsistence patterns managed to survive over millennia, while constantly evolving to match the changing socioeconomic, climatic and political conditions.

This study aims to understand the changes occurring in the agricultural strategies in Castro Marim, Portugal with the arrival of the Phoenician-Punic merchants during the period between the 8th-5th centuries BC. The diet and mobility of wild fauna and livestock during 8th -5th century BC is reconstructed using stable isotope (C, N, O, S, Sr) analysis of zoo-osteological materials (bone and teeth). Crop choices and land management practices are investigated using both traditional morphometric and stable isotope analysis of the archaeobotanical records (charcoal, seeds and plant macro remains). The information obtained here is complemented with the results from pollen and non-pollen palynomorphs (NPPs) analyses to allow a better understanding of the influence of climate change on the Castro Marim’s inhabitant lifestyle.

This research is hosted at Universidade de Évora (Portugal) in partnership with Sapienza Università di Roma (Italy) and it is carried out within the Marie Skłodowska-Curie European Doctorate (ED-ARCHMAT, grant agreement no. 766311).

3 TRANSDISCIPLINARITY IN PRACTICE: THE INVESTIGATION OF ROMAN CU-BASED ARTEFACTS AND SOIL FROM RAKAFOT 54 (BEER SHEVA, ISRAEL)

**Abstract author(s):** Peters, Manuel J.H. (Department of Applied Science and Technology, Politecnico di Torino; Department of History, Universidade de Évora; HERCULES Laboratory, Universidade de Évora; Department of Bible, Archaeology & Ancient Near East, Ben-Gurion University of the Negev) - Goren, Yuval - Fabian, Peter (Department of Bible, Archaeology & Ancient Near East, Ben-Gurion University of the Negev) - Bottaini, Carlo (HERCULES Laboratory, Universidade de Évora) - Mirão, José (HERCULES Laboratory, Universidade de Évora; Department of Geosciences, Universidade de Évora) - Grassini, Sabrina - Angelini, Emma (Department of Applied Science and Technology, Politecnico di Torino)

**Abstract format:** Oral

This research focused on the preliminary analysis of copper alloys, corrosion, and soil components from the Roman archaeological site of Rakafot 54 in Israel. To design a proper strategy for conservation treatment and storage, it is important to understand the degradation processes of metallic artefacts. One archaeological site can yield similar artefacts in different states of preservation, which can relate to variations in environmental parameters. A transdisciplinary approach can be beneficial to better understand such processes. In this case, the archaeometrical approach consisted of a combination of archaeology, physical geography, and materials science, providing a more holistic view of the degradation process of the artefacts.

pXRF, XRD, and micromorphological analyses were carried out to gain a better understanding of the corrosion processes affecting the copper alloy artefacts by characterising the alloy composition, soil environments, and corrosion products. Preliminary results indicate that the artefacts consist of copper-lead-tin alloys, covered by copper hydroxy-chlorides and lead sulphates. The soil is the local loess, which consists predominantly of quartz, calcite, feldspars, clay minerals, and gypsum. Although there are local differences in the soil components of the various samples, they do not appear to have a clear effect on the corrosion.

The overarching purpose of this research was to obtain a better understanding of the various factors influencing the degradation of the artefacts, by using a multi-analytical approach that relied on elemental, mineralogical, and petrographic characterisation. While there are several limitations, mostly resulting from the relatively small amounts of corrosion available for analysis, the presented results provide interesting directions for future research, which will focus more strongly on the relationship between alloy components and microstructure, soil conditions, and corrosion products. This research benefited from the transdisciplinary international collaboration between three different laboratories, which will be further expanded and improved in the near future.

481 CROSS-DISCIPLINARY APPROACHES TO THE STUDY OF ARCHAEOLOGICAL WOODCRAFTS AND OTHER PLANT-BASED IMPLEMENTS AND STRUCTURES [ARCHAEOLOGY OF WILD PLANTS]

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Martin Seijo, Maria - Piqué i Huerta, Raquel (Universitat Autònoma de Barcelona) - Domínguez-Delmás, Marta (University of Amsterdam) - C. Vaz, Filipe - Tereso, João (Universidade do Porto. CIBIO-InBio)

**Format:** Regular session

Wood has been ubiquitous, widely available and multi-purpose raw material used through History. Wood (and other plant-based materials) have been used for crafting individual possessions and utilitarian utensils as well as for building dwellings and other kind of buildings, or even for making means of transport -such carts, sleds, boats, etc.-, carving sculptures and figures, etc. Crafting wood involves botanical knowledge, distinctive material understanding, technological developments and transfer of knowledge and it is closely linked to forest (and scrubland) management. Current archaeobotanical research indicate the existence of a long tradition in the use of some species through Europe that have been used for similar purposes during millennia, but also reflect the changes related to the incorporation of technical innovations for acquiring wood, conversing and crafting this raw material. This has resulted on the development of specific technologies not only for crafting but also for managing forests (and scrubland) to provide adequate raw materials for basketry, woodworking, etc. This session welcomes cross-disciplinary approaches -combining archaeology, archaeobotany, dendrochronology, ethnoarchaeology, experimental archaeology and/or ethnobotany- dealing with wood acquisition -including forest management-, addressing the study of wooden objects and structures, applying cutting-edge research to the study of crafted wood, as well as integrating investigations that combined ethnoarchaeological studies, experimentation performed by artisans.

This session is organised in conjunction with the PlantWild Community of EAA.

ABSTRACTS

1 NEOLITHIC COILED BASKETRY IN THE NORTHEAST OF THE IBERIAN PENINSULA

**Abstract author(s):** Herrero-Otal, Maria - Romero Brugués, Susagna - Piqué Huerta, Raquel (Autonomous University of Barcelona)

**Abstract format:** Oral

Baskets, as objects closely linked to the daily life, have played an important role in all societies. Nowadays, in Europe, their use is limited and mainly related to ornamental and non-utilitarian purposes. However, in the past they were probably used for multiple daily needs like storing, transporting and making implements for different objectives. Only three sites have provided this type of evidence



until now. The earliest evidence of baskets production in the Iberian Peninsula is dated at the beginning of the Neolithic (5300-5000 cal BC). The water logged site of La Draga in Banyoles (Girona, Spain, dated 5300-5000 cal BC) and the well-known remains of the Cueva de los Murciélagos in Albuñol (Granada, Spain, dated ca. 5200-4600 cal BC) were until recently the only cases of neolithic plant-based crafts. The latest excavations in the Coves del Fem in Ulldemolins (Tarragona, Spain) have added new examples of plant crafts dated 4941-4545 cal BC. The site has provided several carbonized baskets or mats fragments. In this paper, we analyze the variability of documented techniques and we explore methods for a more accurate raw material identification. The few remains recovered show variability concerning the use of manufacturing techniques and vegetal fibers. However, coiled methods are the only ones documented in all of three archaeological sites mentioned before. Regarding raw materials, several types of monocots were used but also basswood has been recorded.

2

## WOODTURNING IN IRON AGE CONTEXTS OF NORTHERN IBERIA: INTERPRETING ARCHAEOLOGICAL CRAFTS FROM THE PERSPECTIVE OF ARTISANS

**Abstract author(s):** Martin Seijo, Maria (Universidade de Santiago de Compostela)

**Abstract format:** Oral

Plant-based materials and the objects made from them were vital in the past day-to-day life and, formed a significant part of craft practice for Iron Age communities of northern Iberia. The first aim of this oral presentation will be summarising all kind of evidence related to woodturning in the northern fringe of Iberia, considering not only wooden crafts but also material crossovers and integrating the study of pottery skeuomorphs, objects and decorations carved in stone and indirect evidence as clay imprints. The second aim will be to explore wooden material culture from the perspective of craftspeople. The integration of artisans in the study of the Iron Age material culture made of wood enlarges and expands the information provided by archaeological, archaeobotanical and contextual data through their experience and material engagement. This approach will also involve an accurate methodological approach to record all the technological aspects of woodturning -wood conversion techniques, tool-marks, etc.- from archaeological objects as well as from replicas and artefacts currently performed by crafters.

3

## IRON AGE AND ROMAN WOOD-BASED CONSTRUCTIONS IN NW IBERIA

**Abstract author(s):** Costa Vaz, Filipe (CIBIO - Research Center In Biodiversity and Genetic Resources, University of Porto) - Martín-Seijo, María (Universidade de Santiago de Compostela: GEPN-AAT) - Tereso, João (CIBIO - Research Center In Biodiversity and Genetic Resources, University of Porto; Centre for Archaeology. UNIARQ. School of Arts and Humanities. University of Lisbon; MHNC - UP - Natural History and Science Museum of the University of Porto)

**Abstract format:** Oral

Throughout human history, wood has been one of the most widely and diversely used raw-materials, being crucial to assure a wide variety of activities and functions. One of its most prevalent and relevant uses was as the main (or secondary) building material for the construction of dwellings and other varied types of structures.

Numerous Iron Age and Roman sites with indirect signs of wood-based structures have been identified in the NW Iberia. However, very few of them provided in situ direct evidences of this material, either carbonized or waterlogged. The application of archaeobotanical methods and conceptual body to the analysis of these cases provides an opportunity to understand how wood was obtained, shaped and used in these archaeological contexts.

From crude Iron Age huts and storage structures to more complex and challenging Roman buildings, the aim of this paper is to compile, describe and discuss the uses of wood-based constructions found in this region and time periods. Archaeobotanical data, combining published and unpublished data, will be presented from the following sites: Areal, Saceda, As Laias, Nabás and Alto do Castro from Galicia (Spain) and Quinta de Crestelos, Castelinho, Aquae Flaviae, Penices and Crasto de Palheiros, from northern Portugal. Particular emphasis will be made to the link between the physical properties of the wood used and its purpose, as well as distinguishing among these evidences from charcoal assemblages resulting from the use of wood as fuel.

4

## WOOD, CRAFT, LIFE & CONNECTIONS: A ROMAN FRONTIER FORT CASE STUDY

**Abstract author(s):** Sands, Rob (UCD School of Archaeology)

**Abstract format:** Oral

Woodlands, wood and craft skills were crucial to day to day life on a Roman fort and its associated civilian settlement. This paper explores how aspects of these relationships are manifest in the archaeological record. This will be explored through material recovered from the long term excavations at the northern frontier fort of Vindolanda, Northumbria, UK. So far in excess of 1600 objects have been examined - including containers, domestic objects, fine personal items and much more. The surviving assemblage primarily dates from c.85 AD to c.140 AD, and encompasses a range of production skills from basic to fine craft woodworking, the latter requiring long term skill acquisition. Many items imply extended artefact biographies, and indicate both local production and production at more distant locations across the empire.

This paper will consider some selected aspects of the surviving range of artefact types, the necessary craft skills implied and the networks of connections and supply that these suggest. Examining this material also provides an opportunity to reflect on how interpretations are formed and the critical need for collaborative approaches.

5

## TECHNOLOGY OF WOODTURNING AND COOPERAGE IN MEDIAEVAL TOWNS FROM POLAND FROM 13TH CENTURY AD CONCERNING WOOD PROPERTIES

**Abstract author(s):** Barucha, Katarzyna (University of Lodz)

**Abstract format:** Oral

Woodworking technology can be described with examination of: objects with traces of processing, woodworking tools and production waste, the latter being the most difficult to identify. Research indicates use of specific tools, techniques as well as adequate wood species, characteristic for each branch of craft. Observations are made by the author on unpublished archaeological finds, obtained from museums and research institutes, with help of published material. Besides, application of both historical and botanical sciences are crucial for understanding, on one hand - past working conditions, in medieval towns strictly regulated by law, on the other - properties of certain wood species. Ethnology reveals past understanding of wood's nature, attitude to using it and beliefs connected with wood, forest and woodworking. The features of this material were known from the very beginning of human activity, however what medieval craftsman achieved is optimisation of work and relative economy of material and time used during production.

Research carried on from 1950's in Poland have been exposing archaeological remains of artefacts produced in technology of woodturning and cooperage. The most specific products of those professions are barrels and cooper bowls as well as turned bowls and plates, found frequently during excavations in medieval towns. Described relics show a great similarity in shapes, wood species and woodworking techniques used for their production. Researchers agree that the unification observed in woodworking, suchlike in different branches of craft, is associated with specific work organisation, introduced in medieval towns (in Poland from 13th century).

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## NEW AND INTERDISCIPLINARY APPROACHES IN THE RESEARCH OF PREHISTORIC WATERBORNE COMMUNICATION AND EXCHANGE ALONG EUROPEAN RIVERS, LAKES AND COASTAL WATERS [PAM]

**Theme:** 4. Waterscapes: archaeology and heritage of fresh waters

**Organisers:** Luebke, Harald (ZBSA - Centre for Baltic and Scandinavian Archaeology, Schleswig) - Bockius, Ronald (RGZM - Leibniz-Forschungsinstitut für Archäologie, Mainz) - Erič, Miran (ZVKDS - Institute for the protection of Cultural Heritage of Slovenia, Ljubljana)

**Format:** Regular session

It should largely be agreed that in the Early and Middle Holocene the communication and transport routes were mainly based on the intra-European water network and coastlines. However, it is still unclear in what form this exchange of goods, ideas and individuals took place and which vessels were available. In northern Europe, paddles are documented as a means of propulsion for the Preboreal, but boats have only been found for the late Boreal. It is therefore still being discussed whether, instead of dugouts, frame boats were already being used, but archaeological evidence is difficult.

Human adaptive and innovative ability to conquer new ecological niches and to respond to environmental changes with technical innovations has led to the invention of new boatbuilding technologies and the development of well-organized mobility strategies. Mobility is a basic requirement for the exchange not only of material goods, but also of knowledge and ideas and thus of great importance for the socio-economic, cultural and socio-political systems at that time. Cultural constraints, behavioral interactions and social norms could have regulated mobility and communication. Technology and ergology can express the identity of a group and provide insights into contacts and communication between different prehistoric societies.

This session aims to deepen current knowledge within the framework of local, supra-regional, and diachronic development and application of waterborne transport and communication as well as other linked activities. In locations where direct evidence is insufficient, various forms of indirect evidence are employed. Therefore, apart from studies utilising archaeological sources, we would also like to encourage researchers contributing with studies applying analogous data, from the viewpoint of, e.g., ethnography, anthropology, and ethnohistory to help build reference frames and further our understanding about waterborne transport and communication as a phenomenon and its dynamics in the long term.

### ABSTRACTS

1

## SESSION INTRODUCTION: IMPORTANCE OF PREHISTORIC WATERBORNE MIGRATION COMMUNICATION EUROPEAN WATERS NETWORK

**Abstract author(s):** ERIC, Miran (Institute for the Protection of Cultural Heritage of Slovenia)

**Abstract format:** Oral

Our understanding of the roots of how the migration was developed in prehistory is heavily insufficiently. However, we can believe that humankind living near water network and coastlines invent, as Detlev Elmers say 1975, "apparatus" to cross those water network which wraps our planet. That simple apparatus today we call Early Watercraft which help us to evolutionarily developed communication, shipbuilding, navigation and transportation traditions and routes as we know them today. Unfortunately, our knowledge about this scientific discipline is under-researched. Here are several reasons: one of the compelling goals in archaeology is

2 to research just material evidence of human history. The oldest one is 8200 hundred-year-old logboat from Pesse and about 12ky old petroglyphs from Gobustan near Caspian Sea showing read boats with 20 paddlers. However, secondary evidence of migration shows at least 60k years from when Australia was colonised at that time, with crossings to Suhal in EW. Anthropological theory predicts the use of EW by Homo Erectus 800k year ago through the evidence of migration. EW is researched also by ethnologist documented and describe all kind of EW around the world exist even today in many societies and build as was build by our ancestor several thousand years ago. Without changing the technology of building. Unfortunately, al that scientific disciplines do not research together. One pass the other one. Today we will try to deepen current knowledge within the framework of local, supra-regional, and diachronic development and application of waterborne transport and communication as well as other linked activities. Therefore, apart from studies utilising archaeological sources, we would also like to encourage researchers contributing to studies applying comparable data. However, from the viewpoint of anthropology, ethnography, and ethnohistory to help build reference frames and further our understanding of waterborne communication and transport.

2 **SHIP TECHNICAL CONSIDERATIONS ON MESOLITHIC AND NEOLITHIC BOAT BUILDING IN CENTRAL & NORTHERN EUROPE**

**Abstract author(s):** Bockius, Ronald (Roemisch-Germanisches Zentralmuseum; Leibniz-Research Institute for Archaeology; Department of Prehistory)

**Abstract format:** Oral

It is largely accepted that beside logboats which were in use since the later Boreal, other types of watercraft existed in Holocene Europe and beyond. Archaeological remains of prehistoric bark and skin boats are hardly available, however such vessels might have been built already long before the inventions of dugouts. Since the late Pleistocene tools and technologies fulfilled to construct boats from natural sources by glewing and sewing.

More sophisticated building principals are archaeologically attested for the first time by British and Welsh finds of Early Bronze Age multipartite wooden boats which share morphological and structural features of contemporaneous dugout vessels.

This paper discusses data and methods to identify non-rigid boatbuilding in Early Holocene Northern Europe. It focusses also wood technical findings from the Western Baltic and from Swiss lake-dwellings which show timber joints well-known from Northwestern European Bronze Age "plank boats". From this and other compared features results that techniques other than the concepts of lashing and sewing to construct multipartite wooden craft were at disposal to Neolithic communities on the continent as early as in the middle of the 4th millennium BC.

3 **WATERBORNE MIGRATION, TRANSPORT AND COMMUNICATION IN THE NORTHERN EUROPEAN EARLY MESOLITHIC**

**Abstract author(s):** Luebke, Harald (Centre for Baltic and Scandinavian Archaeology) - Groß, Daniel (Centre for Baltic and Scandinavian Archaeology; CRC 1266: Scales of Transformation)

**Abstract format:** Oral

In the Early Mesolithic of Northern Europe the inland water network with streams, rivers and lakes was an important livelihood for hunter-gatherer-fisher communities. At the same time it was also an essential basis for regional and supra-regional migration, communication and transport routes. This is clearly documented by site maps, distributions of stray finds and characteristic individual finds. For instance, the early paddle finds from Star Carr, UK, and Duvensee, Germany show that the network of waterways was not only used as a waymark, but was also actively navigated by boats, even though these vessels have not been recorded archaeologically earlier than from the late Boreal.

Using south-east Holstein in northern Germany as an example, we will discuss the use of the landscape at that time by hunter-gatherer fisher groups. The region is divided by the northwest-south-east running watershed between the North Sea and the Baltic Sea. With regard to the available natural resources and the existing technical skills, we will also use comparative ethnoarchaeological examples for understanding waterborne movements and communication routes in the early Holocene landscapes.

4 **EARLY WATERCRAFT: A PROPOSAL OF BUILDING A NEW PARADIGM TO COLLECTING AND PRESENTING DISPERSED AND UNVISIBLE OLDEST HUMANKIND INVENTION**

**Abstract author(s):** Eric, Miran (Institute for the Protection of Cultural Heritage of Slovenia) - Antlej, Kaja (Deakin University) - Rebernik, Nataša (University of Deusto) - Cartledge, Kayla (Our Songline) - Jaklič, Lailan (LaniXi.deviantart.com) - Solina, Franc (University of Ljubljana)

**Abstract format:** Oral

Early Watercraft (EW) all over the world marks the beginning of human migration, transportation, and shipbuilding traditions. Logboats, rafts, bark boats, and skin boats are one of the oldest and most essential inventions of the humankind, still used today by various Indigenous cultures. Global existence suggests EW could be considered as one of the most exceptional universal cultural heritage despite being dispersed in diverse local and regional contexts around the world. Hence, a higher attention should be given to this human achievement. In this contribution, a new representation method for this dispersed and overlooked cultural heritage is proposed. For this purpose, a new paradigm scheme has been developed, connecting scattered scientific research with audience

engagement focused on disability inclusion with Design for All principles. The proposal will be exemplified with two case studies from Slovenia and Australia later tested with a digital geospatial platform the Early Watercraft Global Virtual Cultural Heritage Environment (EW GVCHE). Since EW is a shared and inclusive heritage, it can serve as a bridge between different continents, countries and time zones, which allows the creation of a unique multi-user experience through immersive collaborative game design focused on availability, accessibility and connectivity. These low-cost and transferable solutions of short gamified extended reality (XR) experiences are inspired by simple computer indie games. Alongside the EW platform, the games will be accessed from various locations, including museums, interpretation centres, schools, and retirement villages as portable pop-up experiences. In Slovenia, a Late Mesolithic logboat from Hotiza will be used to first develop and test the proposed framework. In Australia, the framework will be further investigated in close collaboration with Indigenous Australians, the custodians of the local EW, and will later be ready to be applied to different dispersed heritage environments.

483 **MEDIEVAL STONE MONUMENTS [SEAC]**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Caval, Saša (University of Reading; Scientific Research Centre of the Slovenian Academy of Sciences and Arts) - Busset, Anouk (Université de Lausanne; University of Glasgow)

**Format:** Regular session

Rock is a timeless resource, free and with infinite supply, that generally requires substantial energy input to achieve the final product. When a rock is extracted in a quarry, it becomes a semi-finished product, culturally influenced and therefore significant. This is when it befalls our studies. To design an object from such material the producers had to have the ambition to create a monument with an enduring - if not permanent - presence and a commanding bearing within a space and society. Stone monuments, whether architectural, funerary, landscape or religious markers and elements, embody diverse biographies and convey long-term implications on societies.

This session aims to bring together scientists who delve into medieval stone monuments within European landscapes in the millennium between the 6th and 16th century. The session will take a multidisciplinary approach to explore stone objects in the broadest sense, and its cultural and ecological implications in the past as well as today.

We seek to gather scholars with a diverse range of experiences in the exploration of medieval stone monuments. These scholars may have worked and continue to work within a broad chronological and geographical setting, to inform more localized studies of such material culture. The session aims to reach a vibrant and dynamic audience that will discuss and consider medieval stone monuments to share our current local, regional, national and international endeavours.

**ABSTRACTS**

1 **STEĆCI: THE MEDIEVAL PLURAL HERITAGE OF THE WESTERN BALKAN**

**Abstract author(s):** Caval, Saša (University of Reading)

**Abstract format:** Oral

The paper will present stećci, the medieval tombstones, dispersed in the landscapes of Montenegro, Serbia, Croatia and mostly in Bosnia and Herzegovina (BiH). They characterise a specific funerary phenomenon and represent a unique fusion of traditions, religions, artistic expression and languages. They appear in varies forms, from pseudo-sarcophagi to crosses, slabs and chests. Roughly 10% of stećci bear decorations and inscriptions with their iconographies demonstrating continuity within medieval Europe, as well as unique local traditions. The number of these monuments is staggering: over 72,000 stećci are currently recorded in the Western Balkans, with more than 60,000 found in BiH alone. They embody centuries of Bosnian tolerance, which evolved from long-lasting cohabitation of local, diverse ethnicities that followed different religions: Orthodox Christianity, Roman Catholicism, the Bosnian Church (Christian, proclaimed heretical), and Islam. Remarkably, stećci are not attributed to any ethnic or religious group and have always been considered enigmatic, lacking a clear, explicit belonging.

2 **STONE MONUMENTS AS ACTORS IN EARLY MEDIEVAL BRITAIN**

**Abstract author(s):** Carver, Martin (University of York)

**Abstract format:** Oral

There were great differences between the stone monuments erected in England, Scotland and Wales over the period 400-1100 CE, differences in their numbers, their size, form and locations and consequently in their message and meaning. What caused this diversity? The present research has focussed on the social and economic contexts that prompted the need to procure, fashion and install the monuments. It has found that the process was led and largely driven by the Celtic nations (Pictland, Scotland, Wales, Cornwall and Northumbria) and took off partly from previous prehistoric practice. Here in the 5-7th century the driver was mainly the marking of lordship, while in the 7-9th century the motive was the promotion of the new monasticism led by Anglo-British Northumbria. In the 9th century the immigrant Danes and Norse put their own mark on stone monumentality in the north, signalling a return to lordship. The English heartland in the southeast (England south of the Humber, or 'Southumbria') took little part in the making of

stone monuments until the 10th century when their programme of investment erupted in a wealth of architectural and other forms. These seven centuries of change on one small island can be seen as not only marking territory, routes or sacred places, but as expounding and proclaiming the changing political and ideological affiliations of the different regions. In this sense, stone sculpture is a story-teller.

Source: ‘Monumentality’ a chapter in Formative Britain (Routledge 2019) drew on researches carried out by the Corpus of Anglo-Sax-on Stone Sculpture (British Academy, 1984-2020; ed. Rosemary Cramp), A Corpus of Early Medieval Inscribed Stones and Stone Sculpture in Wales 2007-2013 ed. Nancy Edwards et al; The Art of the Picts 2004 (Isabel and George Henderson); Early Medieval Sculpture in the West Highlands and Islands 2001 (Ian Fisher); and other sources.

3

### TRANSFORMING SACRED PLACES IN EARLY CHRISTIAN EUROPE: THE USE AND REUSE OF CARVED STONES IN BRITTANY AND SCOTLAND

**Abstract author(s):** Busset, Anouk (University of Glasgow; University of Lausanne)

**Abstract format:** Oral

Within the Christianisation process, carved stones hold a prominent role by embodying and expressing Christianity as part of identities chosen by elites, and to convey a message of power in the landscape. These monuments are used within memorial practices, and to embody the sacred for the people experiencing these landscapes. This paper will focus specifically on the role of Iron Age standing stones and carved stones from Brittany and Scotland and their reuse during the early medieval period. Carved stones are indeed strongly associated with territorial boundaries, bridges, or entrances; but beyond demarcating the limit of a religious or secular estate or the passage between lay and consecrated ground, they can also be nodal places in their own right, where the mundane meets the supernatural, habitation meets wilderness, or the living meet the dead. It has been discussed that Christian ritual is basing itself and adapting pre-Christian notions of liminality, but it can also be argued that early Christian monuments are taking an active part in the re-creation of these notions through them being carved. This presentation will examine how carved monuments create these nodal points in liturgical landscapes during the early medieval period. Focusing especially on Pictish stones in Scotland, and reused Iron Age pillars in Brittany, this paper will offer a comparative analysis to discuss the transformative essence of carved stones.

4

### THE ULTIMATE ROCK BAND: WHEN GEOLOGY MAKES MONUMENTS AND MONUMENTS CREATE PLACES

**Abstract author(s):** Johnson, Andrew (Manx National Heritage)

**Abstract format:** Oral

The Isle of Man is a small island of just 580km² which lies in the centre of the British and Irish archipelago and has drawn diverse cultural influences throughout time from the neighbouring shores. In the early medieval era (6th-11th centuries) a rich religious landscape developed containing over 170 chapels and burial grounds. During this period, graves were sometimes marked by simple stone cross slabs, but after a short 10th century pagan interlude marked by a suite of richly furnished Viking Age graves, the fashion for raising increasingly complex carved stone Christian memorials left an Insular sculptural legacy which today attracts international attention. In total more than 200 crosses are known.

In the 12th century, at a time when the custom of raising crosses appears to have only just ceased, the chapels were replaced by a new parochial system requiring just seventeen centres of worship. Previous research has begun to suggest that particular criteria may have been at play in deciding which of the former chapel sites were chosen as the new parish centres. The presence or absence of large stone memorials at these locations is one such factor.

Recent work has visually categorised the raw geological material from which these monuments were worked. By combining these observations with GIS survey data of the island’s varied and complex solid geology, and records of the archaeological sites at which the crosses have been found, it is newly possible to investigate the extent to which the two distributions - of raw materials and finished monuments - relate to each other.

The newly acquired geological data is an important component in considering how circumstances - persons worthy of commemoration, wealthy clients, availability of raw materials, sculptors, accessibility and even pilgrimage - might combine to create places of special religious status.

5

### A LONG-LIVED MEMORY: SYNERGY OF PREHISTORIC BURIAL PATTERNS AND IMAGES IN MEDIEVAL CEMETERIES IN HERCEGOVINA, BIH

**Abstract author(s):** Grahek, Lucija (Institute of Archaeology, ZRC SAZU)

**Abstract format:** Oral

The medieval stećci tombstones are scattered in high numbers across the countries of Western Balkans. One of their perplexing elements is that they are frequently located on prehistoric burial sites, i.e. bronze age mounds. This characteristic aspect can be detected only in the south-eastern Bosnia and Hercegovina, that is in the Herzegovina region. This presentation will give an overview of the distribution of medieval burial sites with stećci tombstones in contrast with prehistoric sites. Based on a more detailed example from the Dabarsko polje area, we will present the starting research objectives that were followed in the archaeological surveys

and excavations of the Hatelji mound. Although, in this case, mostly undecorated medieval tombstones of a chest form appear on the mound, we can distinguish a continuity of prehistoric traditions in decorations of stećci from other sites. We can detect some similarities with the religious-artistic range of prehistoric communities not only in individual ornamental elements but also through the depictions of the human and animal world. Therefore, the presentation we will showcase some examples of decorations on the stećci monuments that can be seen as a reminiscence of long-lived memory.

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### THE ARCHAEOLOGY OF RECOVERY: THE AFTERMATH OF WAR

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Organisers:** Fernández-Götz, Manuel (University of Edinburgh) - Roymans, Nico (VU University Amsterdam) - Principal, Jordi (Archaeological Museum of Catalonia)

**Format:** Regular session

The archaeological study of conflict (from battlefields to military infrastructure and massacre sites) has been experiencing an exponential growth in the last few decades. However, most of the research is focused on the actual moment of conflict rather than on the short, medium and long-term consequences. In this session, we would like to focus on the period after major military events, in particular – although not exclusively – episodes of conquest. What was the demographic impact of war, and how and when did population figures recover (if they did)? Are there evidences for violence and repression in the years/decades after the conquest? Can we see major transformations in social structure or rather elements of continuity? What was the impact of conflict on the landscape and on settlement patterns? Do we observe phenomena of population mobility (for example forced relocation of groups) after war? We welcome papers that discuss these and other related questions, both on a theoretical-methodological level and through specific case studies. The chronological framework of the session encompasses from late prehistory to the early modern period, as we aim to have a wide range of contributions that provide elements for comparison and wider reflection.

### ABSTRACTS

1

### PHARAONIC PLUNDER ECONOMY: NEW KINGDOM EGYPTIAN LISTS OF SPOILS OF WAR THROUGH AN ARCHAEOLOGICAL PERSPECTIVE

**Abstract author(s):** Matic, Uros (Österreichisches Archäologisches Institut)

**Abstract format:** Oral

During the New Kingdom (c. 1550-1070 BC) Egyptian state organised numerous military campaigns in Syria-Palestine in the north and Nubia in the south. The goal of these military campaigns was both to establish firm control over the regions, either through establishing post conflict vassal relations or through direct military presence and settling. Egyptologists have extensively studied textual and iconographic sources on the organisation of these campaigns. The aftermath of the battles has been studied mostly from the perspective of ancient Egyptian royal ideology. Most recently the attention has been turned to the impact of war on the defeated sides, as Egyptian military campaigns targeted also landscape and induced forced relocation of population through the taking of prisoners of war and resettling population groups from one region to another. Plundered people, animals and objects were carefully recorded. Lists of spoils of war preserved on royal stelae and temple inscriptions are a genre of ancient Egyptian texts crucial for understanding not only ancient Egyptian interest in foreign countries but also the impact of plundering on both the victorious and defeated sides. However, the lists of spoils of war did not receive closer attention of Egyptologists. This paper presents their first comprehensive study. Additionally, the results are compared to the representations of objects depicted as being brought by representatives of defeated countries in the so called “tribute scenes” in the tombs of Egyptian private officials and on the reliefs of Egyptian temples. This work will attempt to provide first step in analysing the impact of pharaonic plunder economy on individual regions. Finally, it will be investigated if and how the loss of resources as listed in Egyptian sources can be used to interpret the archaeological record in these regions.

2

### IN BETWEEN TWO GREAT WARS: THE ‘FALL AND RISE’ OF A NEW REALITY IN NE HISPANIA CITERIOR (195-81 BCE)

**Abstract author(s):** Ventós, Gerard - Cabezas-Guzmán, Gerard (Universitat de Girona)

**Abstract format:** Oral

For the entire Middle Republic, Rome’s foreign policy hardly ever showed a clear-cut direction, revealing no particular interest in facing the management of its permanent subjects. In between Rome’s crushing of a major Iberian uprising (195 BCE) and the outbreak of the Sertorian War (82 BC), a new reality emerged in northeast Hispania Citerior after a continuous Roman presence and its daily contact with the natives. Although it has been often argued that Rome’s cultural hegemony followed its military achievements, a closer look at the archaeological evidence allows us to pose new questions on such assumptions. Therefore, this proposal intends to address the consequences of some undetermined forms of control Rome exerted over such areas, focusing our attention more specifically on the Indiketan and Laietanian territories. Three main sites have been thus selected as study cases, since they played a primary role in their hinterlands according to their privileged location: Emporion; Burriac and Ca l’Arnau; and finally El Camp de les Lloses.



- 3

### RESISTANCE, RECOVERY, REBELLION: THE MIDDLE RHINE-MOSELLE REGION BETWEEN CAESARIAN CONQUEST AND BATAVIAN REVOLT

**Abstract author(s):** Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

**Abstract format:** Oral

Responses of societies to military conquests by foreign powers can present a wide range of variation, although some form of resistance is commonly present. But resistance is a broad term that has often been used in a rather loose way, so further precision is needed in order to allow a better understanding of the complexity of scenarios. In order to develop a more subtle approach, this paper will follow Gonzalez-Ruibal's (2014) terminological distinction between 'resilience', 'resistance' and 'rebellion' in order to analyse the integration of the communities from the Middle Rhine-Moselle region into the Roman Empire. The starting point is the military conquest by Caesar in the mid-1st century BC, which led to not only external, but also internal conflict for the local societies which were split between 'pro' and 'anti' Roman factions. New archaeological discoveries are providing insights into the impact of the conquest and its aftermath. Rather than a monolithic trajectory, within the study region we observe different consequences and responses that are reflected both in settlement biographies and the burial evidence. Factors such as social class, gender and geographical setting led to sometimes very different outcomes and responses. However, the situation was far from stable after the Roman conquest, as exemplified by several episodes of overt rebellion, as well as more subtle social practices of resilience.
- 4

### AFTER THE CONQUEST. ROME'S REORGANIZATION OF THE LOWER GERMANIC FRONTIER ACCORDING TO WRITTEN AND ARCHAEOLOGICAL EVIDENCE

**Abstract author(s):** Roijmans, Nico (Vrije Universiteit Amsterdam)

**Abstract format:** Oral

Lower Germanic tribal groups in the far north of Gaul had suffered dramatically from Caesar's Gallic Wars (58-51 BC). Based on historical and archaeological evidence we can characterise the Roman conquest as a phase of chaos, of heavy demographic losses, of disruption of existing social relations and of social disorientation. In this region, Roman imperialism revealed itself in its most destructive form. This catastrophic situation in the Lower Germanic frontier raises the question towards the social dynamics in this area in the early post-conquest period. A comparison of the tribal map of this zone in the Caesarian period and the Augustan/Tiberian period shows – in contrast to the situation in interior Gaul - an almost total discontinuity. The post-Caesarian period is characterised by the ethnogenesis of new groups that was at least partially based on a substantial influx of Germanic immigrants from the east bank of the Rhine. This immigration was more or less controlled by the Roman authorities. The written evidence suggests simple reallocations of tribal groups from the east to the west bank of the Rhine. However, archaeology increasingly shows that processes of migration and ethnogenesis in the post-Caesarian frontier were much more complex than the fragmentary and ideologically determined written sources suggest. Archaeological evidence enables us – much better than a few decades ago – to contextualise and re-evaluate the written sources, thus contributing to a better and more balanced understanding of the social dynamics in this frontier zone.
- 5

### 'THEY MAKE A DESOLATION AND CALL IT PEACE'

**Abstract author(s):** Reid, John (Trimontium Trust)

**Abstract format:** Oral

Such were the iconic words placed in the mouth of Calgacus, the Caledonian chieftain, by the Roman historian Tacitus prior to the battle of Mons Graupius, the first conflict on Scottish soil to receive a name. As we know, it is highly unlikely these words were ever actually spoken but they probably crystallise a perception of post invasion aftermath that was not entirely fictional to Tacitus. It may also be apposite that they were reserved for the scenario being set in Scotland at the time of the first major Roman invasion into a land which was to see several subsequent Imperial incursions worthy of the title "War".

But how much of this negative connotation is borne out by the evidence from supra-mural Britannia and was 'desolation' a persistent feature of the Roman occupation of this northern territory? Did the 'unconquered' peoples of north Britain suffer more than other peoples beyond the Roman pale and did resistance come at a heavy price?

This paper will seek to triangulate the archaeological evidence to help explore if a 'desert' was created post invasion. Is the absence of evidence of positive impact really evidence of absence or were Tacitus's words a literary trope? Were the barbarian peoples north of the Wall truly subjected to a debilitating scorched earth policy or is this appearance an archaeological mirage?

- 6

### LARGE-SCALE POST-BATTLE TREATMENT OF DEAD IRON AGE WARRIORS IN DENMARK: LEGACY TO LAND-USE AND SETTLEMENT STRUCTURE

**Abstract author(s):** Hertz, Ejvind (Museum Skanderborg) - Munch Kristiansen, Søren (Aarhus University, Geoscience)

**Abstract format:** Oral

Just after the birth of Christ a large scale battle took place in East Jutland, Denmark. The exact location of the battlefield is unknown though thousands of human bones was deposited at the Alken Enge site next to present-day Lake Mossø evidence the post war aftermath. Traces on-site are especially indicators to new rituals of sacrifice of minimum 380 individuals under the influence of Celtic tradition and religious practice. In the hinterland studies of the paleo-landscape give indications of why Alken Enge was selected as the final destination for the remains of the dead warriors although significant changes in the landscape have been detected since then. As example, pollen studied indicates that the post-battle land-use rapidly transformed from grazing and farming into forest after the deposition of the dead warriors. In a regional perspective, conflict related sacrifices continue from 200 to 450 AD in another minor lake upstream in the Illerup valley, now with a focus on the weapons and warrior's personal equipment. Weapon sacrifices in Illerup Valley have their example in the way the Romans treated equipment from conquered armies, but with a special variant with sacrifices in lakes in Southern Scandinavia. Throughout an approximately 500-years period the Illerup Valley have in the local communities collective memory hence been perceived as a "Sacred Valley" to which was brought large and significant sacrifice to the gods while, at the same time, the land-use was extensified and the near settlement structure seems to disappear.
- 7

### GENOCIDE OR ASSIMILATION? A NEW LOOK AT THE SCANDINAVIAN SETTLEMENT OF THE HEBRIDES

**Abstract author(s):** Cartwright, Rachel (University of Minnesota)

**Abstract format:** Oral

The form that Scandinavian settlement took in the Hebrides has been debated by scholars for decades with proposals alternating between genocide of the preexisting groups or conversely their assimilation into the Scandinavian communities. But perhaps there is an intermediate alternative to this polarization. Written sources, which discuss Scotland throughout the 700s record a series of battles and 'civil wars' amongst the Picts and the Gaels of the Dal Riata, illustrating a volatile political scene in the period immediately preceding the Viking Age. With this in mind, Scotland in the late 8th century can be seen as a land recovering from internal warfare. Rather than complete genocide or assimilation of the peoples occupying the Hebrides in the late 8th/early 9th century, the Scandinavian immigrants were entering into an area with a diminished population. This paper uses historical and archaeological evidence in tandem in order to better understand the Viking Age settlement of the Hebrides and the recovery process taking place.
- 8

### A CASE STUDY OF DESTRUCTION: SZÉKESFEHÉRVÁR, THE CORONATION TOWN OF THE HUNGARIAN KINGS IN THE 16TH-18TH CENTURIES

**Abstract author(s):** Kolláth, Ágnes (Institute of Archaeology, Research Centre for the Humanities)

**Abstract format:** Oral

Székesfehérvár lies between Budapest and the Lake Balaton, on low hills emerging from the surrounding marshlands. It had been an important spiritual centre of the Hungarian Kingdom since the 11th century, as the coronation of the realm's kings was valid only, if it happened here. The Provost Church of the Virgin Mary was also one of the prevalent royal sepulchral places, as the first Christian king, Saint Stephen I (1000–1038) had been buried here. The town also had a considerable administrative and economic role during the Middle Ages.

However, after the death of King Matthias I (1458–1490), during the decades of internal turmoil and the more and more successful Ottoman campaigns – which resulted in the conquest of Central Hungary by the middle of the 16th century – the town's strategic importance emerged as well, as a garrison guarding the main road to Buda, the capital city.

Székesfehérvár has been captured for a short time by Maximilian Habsburg I in 1490, then by the Ottoman armies led by Sultan Suleiman I in 1543. The most catastrophic siege happened in 1601, when the Christian armies reconquered the settlement, but an explosion and the following fire ruined it almost wholly, including the Church of the Virgin Mary. It was lost to the Ottomans again in 1602 and recaptured only in 1688 by the western forces.

The paper presents the archaeological evidence of these events and of their consequences. The fluctuation of the town's population, the changes in its social and ethnic composition and the hardships the inhabitants endured can also be clearly followed through the find material and various historical sources. It seems though, that their efforts in rebuilding Székesfehérvár has eventually paid off, as the town remained an important regional hub in Hungary to this day.
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### NAPOLEONIC BATTLE IN ROGOŹNICA (STRZEGOM COMMUNE) - RESULTS OF GEOPHYSICAL AND ARCHAEOLOGICAL RESEARCH

**Abstract author(s):** Zdeb, Katarzyna (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw) - Bąk, Judyta (Institute of Archaeology Jagiellonian University)

**Abstract format:** Poster

The Napoleonic period in Europe was marked by battles. At the various fronts (eastern and western) battlefields remained, which

are currently the subject of research. That is why the introduction of battlefield archaeology - archaeology of wars is so important. The combination of archaeological methods and the possibility of obtaining historical information allows to recreate the course of the fighting, as well as determine the place of their remains. Archaeology of the battlefields begins to research to geophysical - non-destructive methods. Among others, GPR searches are being carried out. GPR surveys allow detecting places, e.g. soldiers burials. the location of the grave may be associated with the Lazaret or other post-visor facilities. Such studies were carried out in Rogoźnica (dolnośląskie voivodeship), where in 1813 one of the Napoleonic battles took place. The Prussian-Russian army fought against Napoleon's army. in the village commemorates this event with a monument, and archaeological research was carried out to discover the graves of soldiers.

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MEGALITHS ON THE EDGE: THE PLACE OF CULTURAL TRANSFORMATION

**Theme:** 1. Networks, networking, communication: archaeology of interactions  
**Organisers:** Higginbottom, Gail (Incipit, CSIC) - Diaz-Guardamino, Marta (Durham University) - Tejedor, Cristina (Incipit, CSIC)  
**Format:** Regular session

This session wishes to address approaches and interpretations that determine understandings and values that may have been shared within the greater Megalithic tradition of Europe's Atlantic coastline. Whilst the building of megalithic monuments, which includes stone tombs, standing stones and megalithic buildings, is a worldwide, time-transcending phenomenon, hundreds of thousands were erected across Europe, and thousands of these monuments still exist in situ, highlighting their past and continued relevance in the European Landscape. Significantly in Europe, it appears that most of them were built in the coastal regions where they altered natural places enduringly, with new constructions continuing for more than 2000 years. Despite possible forms of cultural continuity or similarities of community practices, from the times before and after the first appearance of megaliths, the megalithic tradition is often seen by archaeologists as a phenomenal cultural transformation. This transformation has been variously interpreted as sets of conversions, acculturations, absorptions and movements, or a series of all these, differing in temporality and location. Perhaps they were even part of some kind of cultural revolution. Interestingly, it seems that the point of commonality in this transformation may often have been the movement to, across or away from water. Our question in this session is: exactly what role did the Atlantic itself play in these transformations? This can be interpreted literally or figuratively. We want to know what can you tell us about the people and places you are studying in relation to the Atlantic just prior to, during or after the adoption of megaliths? Your research 'place' could even be just next door but the adoption didn't actually happen. Can you tell us why?

Our session will focus on looking at ways of understanding the cultural topographies and transformations of people, places or regions by innovative research approaches – methodological and interpretive, or indeed have inspiring conclusions.

ABSTRACTS

- 1
- WERE THE RIVERS ROADS OR BORDERS IN THE PREHISTORY?: CONTINUITIES AND DISCONTINUITIES OF THE MEGALITHISM THROUGHOUT THE DOURO BASIN**

**Abstract author(s):** Tejedor Rodriguez, Cristina (INCIPIT, CSIC)

**Abstract format:** Oral

The Douro is the third longest river and the largest watershed of the Iberian Peninsula. It covers the upper part of the peninsular Central Plateau, both in Spain and Portugal, and the Portuguese littoral platform. This river is born in the inner of the Iberia, in the province of Soria, and flows into Porto, so much of its route is in the Atlantic territory. But its most singular feature is that currently it marks the border between the two countries, Portugal and Spain, along the area called 'International area of the Douro river'.

This work presents some results of a research in development about the megalithic biographies, based on an exhaustive identification and description of the different phases of use, reuse and constructive, reconstructive and destructive processes in each Megalithic monument, and its diachronic comparison through the application of different chronometric and statistical analyses. The main goal is to identify differentiated behavioural patterns in the use of these contexts over time, but also over the space. In this sense, the Douro Basin is a very suitable territory for this type of research because it presents a wide geomorphological diversity and heterogeneity (valleys, mountains, moor...).

In this presentation I will show what role the Douro river played as a road for prehistoric societies and will highlight the role that this river might have played as a road for the communities along the coastal zone of the Atlantic Façade into this area. It will be seen that there were changes in its importance and functionality as a route of communication and exchange. To demonstrate this, different study variables will be compared, such as architectural types. We shall look at the idea of whether or not the current geographic 'line' of the Atlantic Facade is arbitrarily false.

- 2
- 'LINKING MEGALITHS'. MOVEMENT AND MOBILITY IN THE MEGALITHIC COMPLEX OF GALICIA (NORTH-WEST OF THE IBERIAN PENINSULA)**

**Abstract author(s):** Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT) - White, Devin (Sandia National Laboratories, New Mexico)

**Abstract format:** Oral

Barrow landscapes are one of the most common archaeological remains in the Atlantic Façade of Europe, and their chronology is frequently associated to the Neolithic (megalithic phenomenon) and the Bronze Age period. Approximately 35,000 megaliths and other monuments are still preserved across this territory, testament to a number that is likely to have been much higher. While behind this data there is a clear temporal uncertainty, as most of these remains are unexcavated mounds, these monuments have been analysed based on the idea that their role in the landscape goes beyond their chronology. In this sense, several locational patterns have been identified through fieldwork and modelled with GIS tools, proposing, for example, that megaliths were located in areas with high topographical prominence or in close relation with transit paths which connect different parts of the landscape.

Drawing on former approaches, we study the spatial relation of more than 3,000 of barrows with pathways through the landscape in Galicia (NW Spain). To that aim, we created three geospatial models of pedestrian transportation networks in a GIS environment, and in a second step we generated an aggregate viewshed map to see if megaliths are located in areas of high visual prominence. Finally, statistical analyses were applied to see if mounds are situated near places that would naturally channel pedestrian movement and areas with visibility.

The results allow us to propose that there is a spatial relation of barrows and megaliths with the movement through the landscape, a trend that might be common to the Atlantic façade of Europe as other studies are pointing out. We argue that this relation could be interpreted as a way of connecting the daily live human landscapes and long-distance routes which not only physically connected the communities but also the expansion of the funerary ideas.
- 3
- RECONSTRUCTING THE PAST – A PEAT COVERED FUNNEL BEAKER LANDSCAPE IN LOWER SAXONY, GERMANY AND WHAT IT REVEALS**

**Abstract author(s):** Behrens, Anja - Mennenga, Moritz (Lower Saxony Institute for Historical Coastal Research)

**Abstract format:** Oral

The Elbe-Weser-Triangle in northwestern Germany is situated in the central distribution area of the Funnel Beaker Culture, which is known for its megalithic burial sites. In this area alone, over 100 monuments are known, indicating its cultural establishment and integration. Still, the neolithization process in this area is not well understood, as well as a more precise cultural classification is missing. This is mainly caused by different preservation conditions of the cultural materials, as the landscape consists of Pleistocene grounds with bad preservation as well as Holocene clay districts with high accumulation rates, revealing only few Neolithic traces. Furthermore, vast parts of the landscape are covered by peat, due to intense bog growth commencing c. 7000 BC in the context of postglacial sea level rise. The living environment of the Funnel Beaker Culture was affected directly by this. However, due to continuous bog drainage over the last 100 years and the resulting severe peat shrinkage, a hidden landscape has been revealed in the Ahlen-Falkenberger Moor, dist. Cuxhaven. Recent investigations within the new project "Preserved in the bog", affiliated at the Lower Saxony Institute for Historical Coastal Research in Wilhelmshaven, aim to reconstruct the development of the landscape. Through the combination of archaeological, botanical and geological methods, the environmental impact and how the people of the Funnel Beaker Culture responded to it, shall be evaluated. This research is one of the first steps towards an understanding of the place that the Atlantic Façade may have played in cultural transformation of this area.
- 4
- PASSAGE TOMB PEOPLE: EXPLORING INTERACTION ACROSS THE IRISH SEA**

**Abstract author(s):** Smyth, Jessica - Pigiere, Fabienne (University College Dublin) - Olet, Lilly (University of Bristol) - Madgwick, Richard (Cardiff University) - Buckley, Michael (University of Manchester) - Evershed, Richard (University of Bristol) - Downes, Jane - Mainland, Ingrid (Orkney College, UHI)

**Abstract format:** Oral

Scholarly interest in passage tombs is as old as the discipline of archaeology itself, ranging from origins and chronology, to landscape setting and symbolism. Ironically, given that many of these monuments contain large deposits of human remains, we know relatively little about the nature and structure of the prehistoric communities that raised them.

Erected several centuries after the arrival of farming in each region, these 'mega' tombs may be responses to economic stress or, equally, the result of surplus and increasing social competition. The Passage Tomb People project (IRC Laureate 2018-2022) is investigating the social drivers of passage tomb construction along the Atlantic Façade, examining the diets and ranges of movement of people and animals across three key zones – Ireland, North Wales and Orkney. This will be achieved through large-scale programmes of molecular and isotopic analyses tailored to the taphonomic conditions of each region, crucial in successfully mining these otherwise challenging archaeological horizons and materials. Specific lines of investigation involve (i) species identification (human versus animal and species abundances) of highly fragmentary bones via collagen peptide 'fingerprinting', (ii) dietary assessments via carbon and nitrogen stable isotope analyses of human skeletal remains and food residues in pottery, (iii) strontium isotope analyses to investigate mobility and connectivity, and (iv) systematic radiocarbon dating of bone and absorbed pottery



**Abstract author(s):** Valdez-Tullett, Joana - Barnett, Tertia (Historic Environment Scotland) - Robin, Guillaume (University of Edinburgh) - Jeffrey, Stuart (School of Simulation and Visualisation, The Glasgow School of Art)

**Abstract format:** Oral

In Scotland there are many examples of carvings embedded within the fabric of Late Neolithic and Bronze Age monuments. Although some of these carved stones bear little resemblance to the local tradition of open-air rock art, also known as Atlantic Rock Art, many appear to have been quarried from natural carved outcrops and re-used in monuments or to have been carved specifically for the purpose, but closely following the imagery displayed in open-air contexts. Similarly, there are a few examples of open-air outcrops where motifs more typical of Megalithic Art were carved on natural outcrops or boulders.

These characteristics and relationships between open-air rock art and Megalithic Art are found in many regions of Atlantic Europe, notably in areas of England and Ireland, suggesting a mutual understanding of these traditions between geographically disparate regions.

This paper reflects on the role of rock art in cultural transformation in Scotland. The Arts and Humanities Research Council (AHRC) funded Scotland's Rock Art Project (ScRAP) is currently building a large body of data of unprecedented detail, contributing significantly to a better understanding of the rock art in this country. A recent study has suggested that the open-air carving tradition is entangled with a wider phenomenon that spread along the Atlantic seaboard through networks of exchange and cultural transmission (Valdez-Tullett 2019). We will explore this theme further using innovative computational analysis and new data produced by ScRAP. By focusing on areas of Scotland that are usually overlooked in favour of the outstanding examples of rock art in Kilmartin and Dumfries and Galloway, for example, we examine the transformative potential of cultural connectivity within Scotland and in the wider Atlantic region.

6

MEGALITHS ON THE EDGE OF TIME: IBERIA AND WESTERN BRITAIN

**Abstract author(s):** Higginbottom, Gail (El Instituto de Ciencias del Patrimonio - Incipit, CSIC)

**Abstract format:** Oral

This paper reveals the second set of comparative results to come of out The Marie Skłodowska-Curie action (MC) - SHoW - Shared Worlds: revealing prehistoric shared worlds along Europe's Atlantic Façade. This project asks: what is the likelihood that cultural ideas related to megaliths and the natural world came from Iberia, directly or otherwise, and established themselves in western Britain? In Higginbottom's 2020 work on Bronze Age monuments of Scotland, it was concluded that through 'the construction of stone, water, the land, the cremated dead and specific astronomical phenomena, ... builders of monuments produced dramatic bounded visual events in time, that were played out using a spectacular show based on light and darkness, and, manipulating these through positioning of monuments, demonstrated the significance of the Sun for them and its connection to life, and its lack, to death'. This current presentation focuses on the Neolithic. Using 2D/3D GIS and immersion technologies it will reveal the landscape choices of people for the erection of megalithic monuments on both sides of the Atlantic Façade. Unlike other works to date in this project, it will concentrate on the narrative and notions of 'moments in Time' that certain Neolithic people embraced and which can be observed moving through, and perhaps with, cultural groups across the Façade. The primary variables to assess these notions or narratives of Time concentrate on topographical data, astronomical phenomena and monument architecture. Combining these variables will reveal a link between Late Neolithic megalithic architecture and cultures across the seas, and possibly the relationship between Time and Death was seen differently, by those of the Earlier Neolithic.

a.

STONE-COLD SOBER: RE-EVALUATION OF ESTABLISHED THEORIES ON MEGALITHIC MONUMENTS BETWEEN THE ATLANTIC FAÇADE AND THE BALTIC SEA

**Abstract author(s):** Brinkmann, Johanna (Institut fuer Ur- und Fruehgeschichte Kiel)

**Abstract format:** Poster

The megalithic monuments in the coastal regions of Northern Europe have been subjected to numerous studies which have resulted in a variety of interpretations and theories about their function, use and original meaning. These interpretations are often closely connected with more overarching concepts such as diffusion or acculturation. The Atlantic façade/North sea seaboard is ascribed various roles in these theories. E. g. in Renfrews classic paper from 1976 it is viewed as a barrier for the expansion of the Neolithic way of life, causing population pressure which resulted in a need to build megaliths as territorial markers in the course of the acculturation process. In contrast, the Atlantic has been described as a medium for contacts in the development of megalithic monuments and the Neolithisation process (e. g. Sheridan 2010). In the evaluation of these theories, it becomes apparent that specific premises are often predisposed and implicit concepts are not reflected (e.g. the predominance of inter-group competition or hierarchisation). By examining existing theories on Neolithic monumentality and discussing them against the archaeological record of three study areas (British Isles, Scandinavia and northern Germany) in the period between 4500-1800 BCE, an evaluation by means of archaeological evidence is conducted. Facing the variability of the megalithic tombs and the associated material phenomena, it becomes apparent that they can only be understood in their specific archaeological context. Unclear stratigraphic sequences, open chambers and frequently disturbed features together with a lack of absolute dating make generalised interpretations extremely

problematic, especially because we have to accept the fact that their use periods go far beyond the Neolithic. Thus, in the case of the megalithic monuments, a transformation process can not only be observed as continuity and discontinuity in the archaeological record, but also in the shift of theoretical concepts used by the scientific community.

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'...IN WITH THE NEW!' UP AND COMING ARCHAEOLOGICAL RESEARCH IN MEDIEVAL EUROPE IN 2020

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Organisers:** Busset, Anouk (University of Glasgow) - Sawicki, Jakub (Institute of Archaeology of the Academy of Sciences of the Czech Republic)

**Format:** Session with presentation of 6 slides in 6 minutes

For the third time, postgraduate students and early career researchers whose interest focuses on Medieval Europe will have the opportunity to present their ongoing research during this session proposed by MERC. It offers a platform for speakers not only to present upcoming projects, but also connect with a wider community of early career researchers. This session will offer opportunities to discuss new and promising research avenues that will shape tomorrow's medieval archaeology, through short and dynamic talks of six minutes. At the same time, we want to create a space for opening up stimulating discussion, and spark possible ideas for future collaborations. The presentation of experimental or unprecedented work is also explicitly encouraged. We welcome papers tackling a wide variety of currently pressing as well as innovative themes, crucial concerns for the field, potential of new technologies, unexplored avenues, and new work on old subjects/materials. We aim to bring together a diverse group of early career scholars, therefore participants from all geographical backgrounds are encouraged to submit a proposal.

ABSTRACTS

1

BED BURIALS IN EARLY MEDIEVAL EUROPE

**Abstract author(s):** Brownlee, Emma (University of Cambridge)

**Abstract format:** Oral

Burial in a bed is a rare phenomenon, but one which is found persistently throughout early medieval Europe. Bed burials are found across a wide geographic area, from England in the west, Slovakia in the east, and Scandinavia in the north, while their chronological distribution ranges from the late fourth century to the ninth century. The identity of the people buried in these graves was diverse, including men, women, adults and children, and they were accompanied by a range of grave goods, some particularly well-furnished, others less so. While some have explicit evidence of Christian belief, others show no clear religious affiliation. The bed burials found in seventh-century England have been well-studied as a group, but they have yet to be placed in their broader European context.

This paper will bring together evidence for bed burials from across the entirety of early medieval Europe, and will assess how this unusual rite may have been interpreted in different regions and different time periods. This provides evidence for how ideas about the dead may have circulated in the early medieval world.

2

INTEGRATED CULTURAL HERITAGE MANAGEMENT: 3-D DIGITAL RENDERING AND WEB DATABASE DEVELOPMENT FOR THE CITY OF IOANNINA DURING THE OTTOMAN PERIOD

**Abstract author(s):** Chroni, Athina (Antiquities-Ministry of Culture-Hellenic Republic; National Technical University of Athens) - Georgopoulos, Andreas (Laboratory of Photogrammetry-National Technical University of Athens)

**Abstract format:** Oral

Being at the crossway of trade routes, at the northwestern corner of Greece, Ioannina city has flourished both economically and spiritually in the past centuries. The governance by overlords of different nationalities, the coexistence and cohabitation of people of diverse religions, ethnicities and cultural identities have shaped a unique, highly fruitful and creative multicultural character for the city. The ever-evolving dynamics of the city have been depicted in buildings, public or private, religious or secular, conventional or more elaborate, each having its own particular historical and architectural interest.

Unfortunately, most of the landmark buildings have been destroyed due to natural disasters and the unbridled, often uncontrolled modern constructions. However, the existence and form of several of those edifices survived thanks to fragmentary information of various kinds, while their position in the urban web and their dimensions can be clarified, in several cases, by their comparative studies with buildings recorded at the same representations whose location and dimensions are known or buildings preserved until today.

To the above ends, all the available historiographic, bibliographic and archaeological information has been collected, analyzed, cross-examined and the outcome of our scientific findings is being digitally processed and furthermore combined with the study of cartographical data, as well as with optical displays, the oldest possible date they can be traced, and also relevant descriptions of travellers, the oldest so far dating back to 1670, by Evlogia Celebi. As a result, the location of Ottoman era landmarks within the modern city's urban web.

Furthermore, the application of new methodologies and digital technologies in the field of culture, render possible the integrated



documentation, management and highlighting of cultural heritage data nowadays, thus allowing the implementation of the respective 3-D models and the development of a G.I.S. interactive web platform.

3 MEDIEVAL ISLAMIC FORTRESSES: ARCHAEOLOGICAL EVIDENCES OF ENTWINING CULTURES

**Abstract author(s):** Sarcinelli, Irene (University of Primorska)

**Abstract format:** Oral

The comprehension of the historical phenomena and driving factors that led to the development of the medieval Bilad al-Sham military fortresses is a challenging task for researchers. The 12th and 13th centuries represent a turning point for Islamic military architecture and the evolution of defense systems. However, it is clear that it stems from a long merging process of mutual ideas and expertise involving different cultural and political groups. While the concept of mutual influence is generally accepted by scholars and supported by chronicle sources, it is hard to retrace it from an archaeological point of view. In this regard, too often speculative statements were treated as facts and a systematic archaeological research was overlooked.

The most debated (and yet quite superficially treated) issue concerns the actual contribution of Armenian masons to Islamic military architecture. From an archaeological perspective, it is necessary to establish to what extent it could actually be recognized with sufficient scientific rigor. Starting from the metrological studies by H. Hanisch, this paper proposes an original research on the archaeological evidences of Armenian masons’ contribution to Islamic military architecture in the medieval Bilad al-Sham, with particular reference to the citadels of Harran and Shayzar, and an overview of the main open issues regarding the subject.

4 IRON IN BORGUND – A SMALL TOWN’S ROLE IN THE ECONOMY OF IRON IN MEDIEVAL NORWAY

**Abstract author(s):** Hope, Brita (University Museum of Bergen)

**Abstract format:** Oral

Borgund was a small town situated on the western coast of Norway. It emerged during the Late Iron Age and was abandoned by the end of the Middle Ages. In the 20th century comprehensive archaeological excavations took place, and the contours of what Borgund once had been were being revealed.

This talk presents a PhD project concerning the economy of iron carried out in Borgund. The excavations revealed a high number of iron objects and slag compared to other medieval towns in Norway, indicating that iron trade held an important part in Borgund’s economy.

Whereas earlier research on iron production in Norway have mainly been investigating the extraction of ore in outfield areas, this study focuses on processing, distribution and use of iron in an urban context. By quantifying objects and categories, a deeper insight into what characterized the consumption of iron at Borgund is achieved, and the scope of demand for iron in medieval communities is being illuminated from a different perspective. The relationship between demand and production of iron will be looked upon from a small town’s perspective: what characterized the consumption of iron at Borgund, and what role did the town play in processing and distributing iron on its way from extraction to market?

The spectrum of finds represents a good opportunity to learn more about the economy of Norwegian iron from the Late Iron Age into the Middle Ages, as well as how it played out in European trading networks.

The PhD study is part of the Borgund Kaupang Project, which aims to get a deeper insight into the character of the town’s economies and network.

5 DEALING WITH ‘FOREIGN’ OBJECTS IN VIKING AGE SCANDINAVIA – NEW QUESTIONS FOR OLD FINDS

**Abstract author(s):** Kuhn, Laura (University of Freiburg)

**Abstract format:** Oral

Intensive contacts between societies from Scandinavia, the North and Baltic Sea, the European continent as well as regions as far as the Byzantine Court or the Islamic Caliphate during the Viking Age have, among other things, resulted in a great amount of objects with distant provenances that were uncovered in Scandinavia. Apart from questions concerning the networks and the nature of these contacts (looting, trade, gift-giving, missioning etc.), the meaning of the ‘foreign’ objects within Scandinavian societies forms a key aspect of their analysis.

Focussing on metal vessels as a case study, my research aims to reconstruct this meaning. Whereas previous studies mostly stop with a notion of ‘foreign’ objects as prestige goods, I argue for a thorough methodology, that takes local material culture, the actual use of the artefacts and their find contexts into account. Only against the background of the function and handling of these vessels – as parts of tableware, finally deposited in graves – and in comparison with local objects can we gain an understanding of the meaning(s) their origins might have had. This biographical, relational and contextual perspective on the artefacts leads to a dynamic and nuanced insight into how Scandinavian societies of the Viking Age dealt with these tangible results of their far-reaching interactions.

6 POTTERY AND SOAPSTONE VESSELS FROM BORGUND: TABLE- AND KITCHENWARE AS AN INSIGHT INTO A MEDIEVAL NORWEGIAN TOWN’S SOCIOECONOMICS AND TRADE

**Abstract author(s):** Blobel, Mathias (University Museum Bergen)

**Abstract format:** Oral

The medieval town of Borgund in Sunnmøre was a thriving fishing and trading community in coastal western Norway. From its founding in the 11th century to its demise in the 16th, it spans the extent of Norway’s Middle Ages. Although it was partially excavated in the mid-20th century, the results have never been published to any large extent. By reevaluating and publishing this data, the Borgund Kaupang Project strives to present the rare archaeological evidence from this example of a second-tier medieval town on the Norwegian seaboard.

This talk will present the author’s PhD project as part of the Borgund Kaupang Project. In the Middle Ages, Norway did not produce any pottery. The resulting reliance on imported pottery for tableware and the use of indigenous soapstone vessels for kitchenware make for a unique opportunity to study trade networks on both a local and an international scale, as well as aspects of status, economics and identity among a medieval community.

Dealing with legacy data from excavations carried out when medieval archaeology was in its infancy comes with its own set of challenges. In order to overcome these, this project applies a wide variety of research techniques. On the basis of situating the extensive finds of potsherds of either material in the context of the Borgund excavations through classical stratigraphic and typological means, data collation on the basis of a graph model will aid interpretation and simplify any subsequent publishing of research data as Linked Open Data. Several methods of finds analysis, such as the observation of soot patterns and food incrustations, as well as geoarchaeological provenance studies of soapstone origins and possibly portable XRF analysis will aid in the reconstruction of the streams of imports, trade connections, social hierarchies and daily life of a medieval Norwegian town.

489 25 YEARS AFTER: PAST AND FUTURE OF SOME COMMON PLACES IN ARCHAEOLOGY [EAA]

**Theme:** 7. 25 years after: The changing world and EAA’s impact since the 1995 EAA Annual Meeting in Santiago

**Organisers:** Criado-Boado, Felipe (Institute of Heritage Sciences - Incipit), Spanish National Research Council - CSIC) - Kristiansen, Kristian (Department of Archaeology, University of Goteborg)

**Format:** Regular session

In September 2019, it will be 25 years since the First Annual Meeting in Santiago de Compostela. This is a good reason to come back to the topics that were discussed in that occasion and revise the development, present situation and future perspectives of them. The first idea is to invite all the Santiago 95 session organizers-chairpersons-discussants, to revisit the topic they were chairing 25 years ago revising what was the state of the art in 1995, how it evolved and what is its expectable future. The main themes are that stage were the same main topics that EAA Annual Meeting have kept for many years since then: Interpreting the Archaeological Record; Managing the Archaeological Heritage; and Politics of Archaeological Practice. Under these themes, there were sessions, for instance, on archaeology of power, spatial regularities in archaeology, development of old metallurgy, emergence of social complexity, organization of commercial archaeology, urban archaeology, archaeology conservation and the changing of rural landscapes, pilgrimage, public works, commercial use of the past, rescue archaeology and the production of knowledge, identification of Ethnicity, Europe(an Archaeology) as seen by a non-European (Archaeologists), Historical Archaeology, or the contribution of Islam to the construction of Europe. The organizers of this session are those who were the president of the EAA at that stage and the organizer of the Annual Meeting.

ABSTRACTS

1 PAST PRESENTING.

**Abstract author(s):** Shanks, Michael (Stanford University)

**Abstract format:** Oral

At EAA Santiago 1995 the session Presenting Archaeology, in the group Politics of Archaeological Practice, dealt with the essential role of mediation in all archaeological work, not only presenting to publics in heritage management, managing museum collections, archaeology in the media, but also broader themes of writing, imaging, communicating as essential components of knowledge building. The session’s theme remains highly topical and I will offer comments on the evolution of three, albeit often latent, aspects of archaeology conceived as productive praxis, working with and through remains. Performance design will be sketched as a paradigm of knowledge. There has been an extended examination of human experience as a key and manifold category of interest, embracing the cognitive, sensory and corporeal, and evaluative and emotional. And heritage is now well-conceived as actuality, memory practices, the active articulation of pasts-presents-futures. I will connect these three themes with wider current trends in archaeology concerning materialism and agency; heritage politics and matters of identity and affiliation past and present; and the proliferation of scientific techniques and rationalized methods. In all my argument will augment recent calls in the EAA for engaged archaeological practice.

2 FROM SANTIAGO TO BUDAPEST AND BEYOND: PAST AND FUTURE OF ROCK ART STUDIES IN EUROPE

**Abstract author(s):** Diaz-Guardamino Uribe, Marta (Durham University) - Valdez-Tullett, Joana (Historic Environment Scotland)

**Abstract format:** Oral

This contribution will evaluate the development of rock art studies under the umbrella of the EAA during the last 25 years, assess the contribution of the EAA to the current state of the art, as well as future perspectives of this area of archaeological enquiry in Europe. Our point of departure will be the session devoted to rock art held at the first EAA meeting in Santiago 25 years ago. The session, titled ‘Rock Art as Social Representation’, and its contributions showcase some of the key components of the state of the art of rock art studies in Europe in the mid-1990s. Traditionally, rock art had attracted broad interest but its study often failed to integrate within wider studies of prehistoric societies. The papers presented at the first EAA meeting reflected a shift in this tendency showing an increasing concern with the role of rock art in past societies. The contributions were influenced by wider developments and methodologies being implemented in archaeology including structuralism, contextual and landscape approaches, and ethnography. Since the mid-1990s onwards the theoretical changes and methodological innovations experienced by rock art studies in Europe have been multiple and very diverse. In this contribution we will outline some of the key developments through the analysis of the different sessions dealing with rock art held at EAA annual meetings since 1995 and until nowadays. This review will seek to reveal main trends throughout the years and how these articulate with the broader current state of research of rock art studies, as well as with emergent and possible future venues of enquiry.

3 ETHNOARCHAEOLOGIES. THEIR PAST AND RECENT ACADEMIC, SOCIAL AND POLITICAL RELEVANCE

**Abstract author(s):** Marciniak, Arkadiusz (Adam Mickiewicz University)

**Abstract format:** Oral

Ethnoarchaeology has emerged as an important subfield of archaeology aimed at investigating contemporary cultures in order to interpret different aspects of the past. The decade of the 1990 was the period in which it became one of the major fields of emotional struggle between the two dominant research paradigms of the time: processual and post-processual archaeologies. This decade marked also the fall of the Iron Curtain and the beginning of more integrative form of archaeological practice across Europe.

In these circumstances, I organized the session ‘Issues in Ethnoarchaeology’ at the First Meeting of the European Association of Archaeologists in Santiago de Compostela in 1995. In my paper I intend to revisit its two major objectives and their relevance to archaeology practiced 25 years ago. These comprise methodological concerns of the academically driven archaeology and the presentation of richness of non-Anglosaxon ethnoarchaeologies vis-à-vis their American and British counterparts. It will then reflect on the role of ethnoarchaeology today and the academic relevance of these issues in the context of profound changes in archaeology and archaeological practice over the past quarter of the century.

4 PRESERVATION OF ARCHAEOLOGICAL HERITAGE IN RUSSIA IN THE XXI CENTURY: LEGISLATIVE REGULATION AND PRACTICE

**Abstract author(s):** Engovatova, Asya (Institute of Archaeology Russian Academy of Sciences)

**Abstract format:** Oral

Russia has been actively participating in the work of the European Association of Archaeologists for 25 years - since its foundation. In the early 1990s, system of archaeological research which developed in the Soviet period was almost destroyed. The fundamentals of the funding system for scientific archaeological research have completely changed.

Since 1992, when Russia signed (but not ratified) the revised European Convention for the Protection of the Archaeological Heritage, in the country begins the formation of a new system of rescue archeology, changing the ratio of scientific research and rescue. Russian archaeologists become members of international organizations, including EAA. The exchange of experience in preserving the archaeological heritage became especially valuable, since at that time Russia was in a situation of legislative vacuum in the field of cultural heritage protection. EEA conferences especially helped the Russian archaeologists of the in resolving issues associated with rescue archeology, preservation of archaeological sites, building the structure of organizations, including commercial archeology.

Improvement of Russian legislation in the field of archeology continued after ratification European Convention for the Protection of the Archaeological Heritage in 2011. The Academy of Sciences represented by the Institute of Archeology has participated in a working group on their development, largely taking into account the experience of European countries in this field. These laws introduced the provisions of the Vallett Convention into Russian law.

Thanks to the legislative measures taken, the number of archaeological investigations in the country has increased sharply - actively conducting research, preceding major construction work, during which hundreds of new monuments are revealed.

Currently, a large part of the staff of the Institute of Archeology RAS are members of the EAA. They present the results of their research at annual congresses, organize separate sections where they share their experience with colleagues from different countries.

5 THE FUTURE OF INTERNATIONAL HERITAGE POLICY AND INTERVENTIONS

**Abstract author(s):** Kathem, Mehiyar (University College London)

**Abstract format:** Oral

This paper takes stock of the evolution of archaeology and heritage related aid modalities and interventions during the past twenty-five years and explores lessons and challenges that will inform global heritage practice over the next two decades. It argues that whilst archaeology is increasingly popularized and mobilised in new interventions to ‘protect’ and ‘safeguard’ heritage, there is a glaring neglect to look at the political causes of heritage destruction, including such things as appropriation and damage, which continue to inflict serious harm on the lives and cultures of millions of people in Africa, Asia and the Middle East. The paper instigates new conversations about the role of international institutions in addressing not only the destructive impact state and non-state actors have on historical sites but also the damage associated with political trajectories and statebuilding processes. The latter part of the paper examines Iraq as a case-study of major interventions in the field of heritage and archaeology since 2003, the legacy of the US-led occupation, the aftermath of the Islamic State and implications on international heritage policy and interventions.

a. THE IMPACT OF EAA - A PERSONAL REFLECTION

**Abstract author(s):** Chadburn, Amanda (Historic England)

**Abstract format:** Poster

I have been fortunate to attend over half of the EAA conferences since my first one in Santiago de Compostela, Spain in 1995, and indeed have published my recently-discovered notes of that first annual meeting in The European Archaeologist 62. Although this session will explore the contribution of the EAA to European Archaeology generally, I want to turn this around and look at how the EAA has impacted on me.

I’ve regularly attended sessions in the main themes of the EAA Annual Meeting since then, especially Interpreting the Archaeological Record and Managing the Archaeological Heritage. I’ve organised Round Tables, Chaired a Committee, made friends. So what have I taken away from all this? How has the EAA impacted on me - which in turn has helped me in my various roles as a professional archaeologist since then? I think these can be summarised under these headings, which will be further explored in my poster:

- Knowledge
- Skills
- CPD
- Engagement
- Networking
- Field Trips
- Outcomes

Our President has kindly written to UK EAA members post-Brexit: This message from EAA, your membership association, is to emphasise the enormous importance of you, our British members, to the EAA – in the past, present and hopefully the future. I want to call on you all to work towards a continuing core role within the EAA in the future.

This is a small contribution from me towards that goal. Let Networking! - the very theme of this meeting - continue!

490 STANDARDISING ARCHAEOLOGISTS’ PROFESSIONAL SKILLS IN EUROPE: NATIONAL DIFFERENCES, TRANSNATIONAL SIMILARITIES [DISCO, PAA]

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Organisers:** Karl, Raimund (Bangor University) - Pintucci, Alessandro (CIA)

**Format:** Round table

Transnational mobility of archaeological labour depends to a large extent on professional skills being transferable between and similarly useful in different national archaeological cultures and regulatory environments. Yet, as research by the DISCO and now also the DOVTA project has clearly demonstrated, there are considerable national (and sometimes even regional) differences in the skills expected of professional archaeologists, and also the techniques and methods deemed acceptable by archaeological regulators. While some of these differences are well-justified by differences in the archaeology itself or the environmental conditions in which archaeological fieldwork takes place, many others appear mostly to be due to historically contingent national archaeological traditions. While there have been some attempts, e.g. by the EAC, to develop transnational European best practice guidance or common standards, as yet, there has been very little discussion on a European level regarding the standardisation or at least mutual recognition of different national approaches of ‘doing archaeology’. Similarly, discussions about possibilities to either standardise archaeological skills training transnationally, or alternatively include in teaching provisions not just the traditional national skills set, but also the skills required for taking up jobs in other European countries, have as yet hardly been had. This joint round table of the EAA Communities on the Teaching and Training of Archaeologists, Professional Associations in Archaeology, and Discovering the Archaeologists of Europe, aims to debate whether there is a need and what possibilities exist (e.g. ESO CEN Standards, ISO Norms, etc.) for developing common European standards for archaeology and archaeological skills training, or for including transnational skills training in national archaeological teaching provisions and training standards.

501 GENERAL SESSION - LANDSCAPES IN FLUX

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Chair:** to be confirmed  
**Format:** Regular session

ABSTRACTS

1 HOW CITY SHAPE TIME? ORIENTATIONS, SKYSCAPE AND URBANITY IN ARCHAIC CAMPANIA

**Author(s):** Cristofaro, Ilaria (Università degli studi della Campania Luigi Vanvitelli)

**Format:** Oral

The significance of religion in cities is here analysed through the study of urban orientation. In particular, archaeological remains are investigated in order to explore how urban spatiality was intentionally put in relationship to astral and celestial cycles. The sky provided both religious and practical points of reference, in a way that some cities layout functioned as a calendar: by founding the city sighting at the sun rising or setting in a precise day, the future annual celebration could have been determined with precision when the sun returned in alignment on the same axis. If this is suggested by Latin sources for Roman colonies as a way to reflect the divine order in the urban space (Gargola 2017, 172), the attempt is to verify a similar pattern where no or little literature is available, but by reconstructing ancient landscapes and skylscapes (Gottarelli 2013). From the Archaic to the Hellenistic period, the area of Campania, in south of Italy, was characterised by cultural dynamism, in a synoecism of Italic, Etruscan, Greek, and Roman components resulting in the foundation and re-foundation of orthogonal cities, such as Pompeii, Neapolis, and Herculaneum. This research investigates the choice to align urban grid as a way to convey religious beliefs and practices during the foundation ritual. How the city was placed within the wider landscape and cosmos? Which were the local ideological points of reference to define a city orientation? How the city, with its precise directionality, shape time, religion, and ritual performances on the anniversary of its dies natalis, in a dialectical relation with its inhabitants? In summary, the research questions if calendrical ritual time was encoded in the architectural urban scheme, investigating how the act of foundation condensed together spatiality and temporality, ritual and cyclical performances, skyscape and urbanity.

2 APOGEE, DECAY AND TRANSFORMATION: A SEDIMENTOLOGICAL STUDY OF THE TEMENOS OF THE ARTEMISION OF EPHEBUS

**Author(s):** Lourenço Gonçalves, Pedro (ÖAI / ÖAW)

**Format:** Oral

In the summer 2020, boreholes were drilled in the area of the Temple of Artemis (Ephesus, Turkey) and, subsequently, sedimentological and geochemical analyses were made on the collected cores. This investigation is part of the multidisciplinary research project “Temenos&Territorium” (ÖAI/ÖAW), which examines the transformation of the Artemision during the Roman Imperial era and also during phases postdating the end of the cult, when the area was virtually “made profane”, including the transformation during Late Antiquity and the settlement activities under Selçuk/Ottoman rule. Since its rediscovery 125 years ago the consecutive temples and associated altars formed the focal point of archaeological research, whereas the surrounding sacred temenos remained without investigation. Geoarchaeological research also concentrated on the early phases of the sanctuary, whereas the accumulation of sediment during the Roman period, as well as the ensuing history of the burial of the sanctuary, have been overlooked. The focus of this new project are not the direct impact of a divinity, nor sacred buildings and votive deposits, but rather the temenos and the properties of the sanctuary as infrastructural facilities, as well as the economic and political power of the sanctuary during Roman times. Recent research gives evidence of the temple as part of a complex of buildings corresponding to its social, economic and religious significance. Environmental and geological studies also demonstrated that the history of the Artemision is directly connected with geomorphological changes that, although clearly resulting from natural processes, were massively increased by human intervention. Our talk summarises the preliminary results of the 2020’s campaign, and, in the light of this new data, it reassesses prior geoarchaeological investigations. The outcomes contribute to the development of a time-space-model of the Artemision of Ephesus from a cultural-geographical perspective.

3 LIFE AT THE FRINGES: ALTERNATIVE WAYS OF STRUCTURING POWER IN CENTRAL ITALY (ABRUZZO)

**Author(s):** Scarsella, Elena (University of Cambridge)

**Format:** Oral

Since the beginning of the Iron Age (9th century BC), the entire Italian peninsula experienced a whole range of phenomena that deeply changed its territorial occupation, together with its social structure. Etruria and Latium Vetus, with a new-born Rome in between, witnessed the most evident development, with the emergence of proto-urban centres on morphological features as hills and tuff plateaux. Beyond these, at the fringes of the fertile Tyrrhenian plains, on the background of the Apennines and across them, something different was going on. Here, structures of power followed a different path, demonstrating that, proto-urbanization, far from being an exceptional phenomenon, is indeed only one of the many possible outcomes of a network of connections that involved

Early Italy. In this presentation, taking as a case-study the mountainous area of modern L’Aquila between the 9th and the 6th century BC, I will follow the development of a non-urban society and its responses to a harsh environment in the context of the short and long-range contacts. Indeed, mountains, far from being isolated, are active actors of that wide-scale phenomenon that was the Orientalising period.

4 SACRED LANDSCAPES IN GREEK SICILY: URBAN AND RURAL SANCTUARIES IN EASTERN SICILY BETWEEN 8TH AND MIDDLE 3TH CENTURIES BCE

**Author(s):** Brancato, Rodolfo - Platania, Erica (University of Catania) - Santospagnuolo, Paola (Freie Universität Berlin) - Scaravilli, Marco (Soprintendenza ABAP Reggio Calabria e Vibo Valentia)

**Format:** Oral

While urban sacred architecture of Greek Sicily has drawn the attention of numerous scholars, extra-urban sacred landscapes has been neglected so far. This contribution sets out methodological objectives and first results of an ongoing research project which aims to fill this gap through an overall review of the available legacy data from Eastern Sicily between the Early Archaic to the Middle Hellenistic periods. The project’s goal is to investigate the relationship between natural environment, rituals and cults. In particular, this study focuses on: placement of rituals and cults in the broader Sicilian landscape by means of inter-site analysis of cult places; computational developments and transformation processes of sacred landscapes and ritual spaces. Data ranging from pottery, faunal remains to architectural and topographical elements have been taken into consideration, but not only. The main focus of the research is indeed the spatial analysis, organised around two major themes: 1) relationships between sacred landscapes, socio-political units and socio-economic networks; 2) artefacts and agency involved in the creation and perception of sacred space.

In order to highlight new aspects of ancient religious practices, a landscape approach may profitably be applied in Sicily across a very broad chronological span, focusing on both inter- and intra-site spatial approaches.

This study will thus allow to identify how the interaction between political and religious structures displayed itself in sacred landscapes during the Greek era: on the basis of a new reading of material culture and settlement patterns, it will contribute to move beyond the ‘Greeks vs Natives’ dichotomy, which for long has been a common interpretative approach in the scholarship dealing with this territory within this chronological frame.

5 BETWEEN CONTINUITY AND PROFANATION – TRANSFORMATION PROCESSES OF EXTRA-MURAL SANCTUARIES DURING THE ROMAN COLONIZATION OF ITALY

**Author(s):** Lehnert, Christoph (Rheinische Friedrich-Wilhelms-Universität Bonn; German Archaeological Institute, Rome Department)

**Format:** Oral

The Roman expansion in the 4th and 3rd century BCE into the central and southern Italian regions intensified contact and clashes with the residing Italic and Greek settlers. The newly founded Latin and citizen colonies were often founded on strategic sites, forming nodes of a network with Rome in the centre; but also embedding itself in the local network of existing settlements, rural sites and not least sanctuaries.

Within the colonies new cults were established, such as the cult of the Capitoline Triad, shaping the space of the newly founded city, i.e. by the construction of temples. On the other hand pre-existing extramural sanctuaries, such as the sanctuary of Uni in Pyrgi or the sanctuary of Marica close to Minturnae, continued to exist and were likely points of exchange between the various ethnic groups of Latin and Roman settlers and the indigenous population.

The key questions I aim to answer with this proposed contribution, based on my PhD research, are how these sanctuaries were transformed as parts of the religious landscape of the colonies, what can be said about the reciprocal relationship of colony and sanctuary and in which way continuous worship or profanation, and the ensuing transformation of space in an extramural sanctuary, reflect agency of Roman citizens or members of different political or ethnic groups.

This shall be achieved by analysing the architectural remains, the infrastructural embedment of the sanctuaries, votive material and inscriptions, hoping to reveal the spatial relationship between colonies and sanctuaries, the composition of the group of dedicators and detectable patterns of change.

6 RELIGIOUS CHANGE AND CONTINUITY IN THE URBAN NETWORK OF CYRENE FROM THE ARCHAIC PERIOD TO THE 2ND CENTURY AD

**Author(s):** Klose, Christoph (FSU Jena)

**Format:** Oral

As many western Greek colonies Cyrene boasted a strong Delphic influence in its foundation story that was ascribed to the myth-historical king Battos Aristoteles, who founded the city allegedly around 631 BC. This influence is represented in the city’s main sanctuary as well as the agora, with two temples dedicated to Apollo and a heroon for the city founder on the agora. The construction history of these monuments has three main phases dating in the archaic period, the 4th century BC and 2nd century AD which show interesting aspects of change and continuity. The renewal of the Apollo sanctuary in the 4th century BC is marked by deliberate references to the Apollo sanctuary in Delphi, that match with the increase of the from now on common epithet of Apollo: oikistes.



This has been interpreted as a sign for a decreasing importance of the founder hero Battos Aristoteles which has been explained by social change within the city, that finally led to the presumed abandonment of his cult place in the 2nd century AD. At that time, Cyrene had been severely damaged by a Jewish upheaval which targeted and destroyed buildings seen as hallmarks of graeco-roman culture, especially sanctuaries. In its aftermath the religious landscape of Cyrene is transformed, but shows a marked conservatism. In this paper I'd like to address questions of how this pronounced traditionalism can be evaluated against the backdrop of a century old religious development and whether it was not in fact much more novel than the shape in which it came.

7 **URSTROMTALS AND BRONZE AGE HOARDS. NATURAL LANDSCAPES AND CULTURAL PRACTICES AND THEIR AMAZING CONVERGENCE IN VARIOUS REGIONS OF POLAND**

**Author(s):** Maciejewski, Marcin (Institute of Archaeology Maria Curie-Sklodowska University)  
**Format:** Oral  
Mobility is one of the hallmarks of the Bronze Age. This was formerly indicated on the basis of the distribution of raw materials and artifacts (mainly metal), nowadays research on solid isotopes (e.g. the Egtved girl), which enables us to look at the movement from the perspective of individuals, confirm it dynamics.

Already in the 1930s, routes were marked by connecting dozens of dots (which symbolized hoards of metal objects) on maps covering hundreds of thousands of square kilometers, this approach was practiced for the next decades.

Looking at the hoards of metal objects from a different perspective – by focusing on individual finds, in the context of the natural landscape and other archaeological finds, give us the possibility to understand how the deposition sites of metal artifacts shaped the Bronze Age landscape.

Finds from Rosko and Karmin, which were deposited in a way indicating that the deposition site was not accidental, could be as good an example. What is more, they were deposited in characteristic places – near the urstromtals (broad glacial valleys), which separate historical regions (Pomerania, Wielkopolska, and Silesia). Thanks to this, it will be possible to present the meaning of hoards in the landscape, as well as the way of understanding how the routes functioned in the Bronze Age. Their connection with clearly indicated physical boundaries, especially with places of their crossing, highlights the meaning of routes on mental maps of the Bronze Age.

8 **THE TRONTO RIVER VALLEY IN PRE-ROMAN TIMES: A KALEIDOSCOPE OF CULTURAL UPDATES**

**Author(s):** Virili, Carlo (Sapienza University of Rome)  
**Format:** Oral  
The Velino and Tronto valleys have always represented natural and obligatory itineraries to reach the Adriatic Sea from those who came from the Tyrrhenian coast. The Apennines were crossed along the river valleys transversal to the mountainous spine which connected to each other through a series of passes. This route, formalized in Roman times with the via Salaria, has allowed a continuous exchange of cultural updates between the two coastal slopes of central Italy allowing the spread of Etruscan goods from the area of the middle and lower Tiber valley to the east. Along with ideas and their material codification, people also traveled. Archaeological research in this area has revealed the presence of prestigious goods from the Tyrrhenian, Tiber and Sabina areas, dating from the IX century B.C. This interaction gave rise to a cultural facies in which the ancient heritage coexisted, reworking them, with the innovations of western Lazio. In this cultural dialectic the prestigious Etruscan bronze goods are inserted, regulated by the economic mechanism of the gift (hospitable, nuptial, tax).

It is natural that they are eagerly sought after, imported and imitated as they are full of aristocratic characters, political-symbolic values necessary for the development of indigenous elite social groups, protagonists of trafficking, relationships and dialogues with those who on the other side of the peninsula had already reached these statutes of privilege and in turn had already metabolized cultural dialectics with the Greek world.

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**GENERAL SESSION - LITHICS IN DIFFERENT CONTEXT**  
**Theme:** 5. Theories and methods in archaeology: interactions between disciplines  
**Chair:** Mester, Zsolt (Institute of Archaeological Sciences, Eötvös Loránd University, Budapest)  
**Format:** Regular session

ABSTRACTS

1 **UTILIZATION AND PROVENANCE OF STONE ARTEFACTS AND RAW MATERIALS FROM IGALIKU (Ø47) AND TATSIP ATAA KILLEQ (Ø172) IN SOUTH-GREENLAND**

**Author(s):** Beck, Sólveig (University of Iceland)  
**Format:** Oral  
Developing models of socio-economic networks in medieval Norse-Greenland is a work in progress. One branch of this objective is the Sticks and stones project, a collaborative effort between the National Museums of Greenland and Denmark, the University of Iceland, and the Geological Survey of Norway (NGU), Denmark and Greenland (GEUS). The project is aimed at bringing into better

focus the nature of raw material utilization and material procurement strategies in the Eastern Settlement at the Southern tip of Greenland between the 11th and 15th centuries, most especially of wood and stone. The aim of this paper is to introduce the preliminary findings of an on-going classification study of stone assemblages from two archaeological sites: a secondary midden uncovered at the episcopal manor in Igaliku (Garðar Ø47) and a sizable farm site Tatsip Ataa Killeq (Ø172) in Vatnahverfi. Combined, the two sites yielded over 1700 stone finds, both artefacts and raw materials. The majority of the finds are comprised of steatite, red sand- and mudstones, and chert, alongside more uncommon materials like e.g. welded tuff, schist and slate. The ultimate objectives are to pinpoint commonalities and differences between the assemblages of the two farm economies, and map raw material variabilities and their potential sources with the aid of typological, petrological and chemical analyses (XRF and LA-ICP-MS), whether they be from within or beyond the shores of Greenland.

2 **SILURIAN FLINT AS RAW MATERIAL IN STONE AGE LATVIA**

**Author(s):** Kalnins, Marcis (Institute of Latvian History, University of Latvia)  
**Format:** Oral  
Silurian flint is the only so far known locally available flint raw material in present-day Latvia used for tool production in the Stone Age. Because of its characteristics Silurian flint is often described as a poor raw material compared to other flint raw materials used in Stone Age of this region.

The primary source of this raw material is carbonaceous sedimentary rock of the Palaeozoic Silurian period. However, in present-day Latvia this geological layer is encountered only at depths of at least 160 m. Therefore, pebbles of Silurian flint naturally occur only in the north and west of Latvia, in Last Glacial moraine and Quaternary cover, considered to be the secondary source of this raw material. It has been observed that the appearance of flint pebbles and the location of Stone Age sites with the highest numbers of finds from this raw material coincides with several ice-flows of the Late Vistulian (Weichselian) glacial maximum.

The earliest evidence of Siluran flint reduction in Latvia is from the Early Mesolithic (9000–8300 BC), when it was used in low frequency. Use of local raw material increased in the Middle Mesolithic (8300–6000 BC), when it became the dominant raw material at sites in the coastal zone of Baltic Sea and was frequently used on sites around Lake Burtnieks. During the Neolithic period (5400–1800 BC) local flint raw material was more frequently used on sites in western and northern of Latvia. However, small number of Silurian flint finds have been discovered outside the observed natural distribution area of this raw material, at Middle and Late Neolithic inland sites in eastern Latvia.

The research is part of the project Izp-2018/1-0171 "People in a dynamic landscape: tracing the biography of Latvia's sandy coastal belt", financed by the Latvian Council of Science.

3 **LITHIC INDUSTRY OF TWO LBK SITES IN MOLDOVA (NICOLAEVCA V AND TIRA II)**

**Author(s):** Kiosak, Dmytro (I.I. Mechnikov Odessa National University)  
**Format:** Oral  
The paper presents comparative technological analysis of lithic collections from two LBK settlements. The site of Tira II was excavated in 1959-1960 by T.S. Passek. The collection reflects extensive use of local raw material with pre-cores, cores and primary/sub-primary flakes constituting a significant part of the collection. Blades are rare and irregular. The finds came from deepened object so likely reflect not the flint-knapping place in situ but rather a structured deposition practice either as a result of "cleaning up" of the knapping area or as a depot of raw material still suitable for future use. The complex preparation resulted in serial production of blades from two-platformed naviform cores. The site of Nicolaeuca V was excavated in 2019 by joint group of researchers. It yielded a lithic collection dominated by products and debris of opportunistic flake-oriented production. The "depot" of pre-cores, cores and flakes was recovered in front of the long house. There was no complex preparation of cores. Rather any suitable angle was used as a striking platform. The "depot" is likely to be a movable cache of raw material carried to the site by a knapper for future use. Both sites yielded similar high percentages of cores. However, their technological roles were different. Excessive blade production (with missing blades) in Tira II differs from household-based simple and situative knapping recorded in Nicolaeuca V.

4 **VARIETIES OF SHAPES AND LITHIC RAW MATERIALS IN SEPULCHRAL CAVES OF PENEDÈS (CATALONIA) DURING THE III MILLENNIUM BC**

**Author(s):** González-Olivares, Cynthia - Mangado, Xavier (SERP-Universitat de Barcelona)  
**Format:** Oral  
In the Catalan archaeological record we can observe many caves that were used during the Late Neolithic - Chalcolithic (III millennium BC) with sepulchral purposes, specifically in the Penedès region (province of Barcelona). In many cases, we found different kinds of elements, such as human remains, pottery, ornaments and lithic industry, the latter as part of grave goods that accompanied the deceased.

In the case of lithic materials that compose the funerary objects, we can observe a great diversity of shapes that refer to the utilities –as endscrapers, long blades, arrowheads and daggers–, which give us information related to the lithic technology. Also, we can identify mobility in the territory, exchange and migration of ideas through the provenience studies of raw materials. Finally, if we consider the funerary context, it is possible to appreciate how some of these pieces have a function of social differentiators.

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### IMPORT – GIFT – EQUIVALENT? INVESTIGATING THE SIGNIFICANCE OF OBSIDIAN DURING THE NEOLITHIC IN POLAND

**Author(s):** Werra, Dagmara H. (The Institute of Archaeology and Ethnology Polish Academy of Sciences, Warsaw, Poland) - Hughes, Richard E. (Geochemical Research Laboratory, U.S.A.)

**Format:** Oral

Some scholars believe that the secret of homo sapiens’ success lies in the unique ability to use articulated speech, which allowed members of our species to exchange information and establish dense and extensive networks of knowledge and contacts. Archaeology allows us to study the manifestations and directions of such contacts by tracing the spread of raw materials.

Obsidian is an excellent raw material to employ for such investigations because obsidians have a distinctive trace and rare earth element composition (sometimes referred to as a geochemical ‘fingerprint’). Once the chemical fingerprint of the parent geological obsidian source has been determined, it is then possible to analyse archaeological artefacts to determine the most likely source location for the raw material based on congruence in chemical composition.

Obsidian artifacts have been documented from more than several dozen Neolithic sites in Poland, dating from the Early up to the Late Neolithic. Since there are no natural outcrops of obsidian in Poland, all of the artifacts and nodules recovered from archaeological sites must have been conveyed there from other places. The question is - how? Who? Where? and why were they brought there?

There are various possibilities for how and why obsidian artifacts and nodules found their way to Neolithic sites in Poland. In some cases, it could have been as a result of redistribution, whereas greater numbers of obsidian artefacts may reflect sites which could have served, at different times, as centres of redistribution. Single pieces are always problematic to interpret, but we have to consider that they may have been personal heirlooms, or perhaps a gift received from a neighbour or distant relative. Ideas from various scientific fields, i.e. archaeology, ethnology, sociology and economy will be applied to investigate these issues.

Investigations financed by National Science Centre, Poland (OPUS 15 2018/29/B/HS3/01540).
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### POTENTIAL TRANS-CARPATHIAN ROUTES IN THE EARLY NEOLITHIC IN THE LIGHT OF CHIPPED STONE MATERIAL. AN ALTERNATIVE PROPOSITION

**Author(s):** Pelisiak, Andrzej (Institute of Archaeology, University of Rzeszów)

**Format:** Oral

The topic addressed by this paper encompasses the trans-Carpathian contacts during the Early Neolithic reflected both in the obsidian assemblages recovered on the Linear Pottery culture settlement-sites located on the Rzeszów-Przemyśl loess zone and the obsidian finds registered within the East Polish Carpathians. There will be discussed alternative to the “Dukla Pass” routes running through the mountain passes in the eastern part of Polish Carpathians. These will be suggested on the base of distribution of obsidian find within the East Polish Carpathians in a context of availabilities of helpful natural elements of the mountain landscape. There are proposed in this paper three possible routes connected LBK area of inhabitation in the Rzeszów-Przemyśl loess zone and the zone of obsidian sources: A1 (along the San, Osława and Osławka Rivers, across the Łupkowska Pass, along the Vyrava and Laborec Rivers), A2 (along the San and Solinka rivers, then along the Solinka River across the Nad Roztokami Pass, and along the Cirocha, Laborec i Onava rivers) and A3 (along the San River and Wołosaty Stream, across the Beskid Pass, and along the Uh, Latorica and Bodrog rivers).
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### FROM THE DIVERSE AND CHAOTIC TO WHAT IS ANALYTICALLY POSSIBLE: COLLECTION, MAPPING AND ANALYSIS OF PROVENANCE OF RAW MATERIALS

**Author(s):** Dam, Peder - Hansen, Jesper (Odense City Museum)

**Format:** Oral

Material-based provenance analysis of e.g. metal, wood, clay and mammals have opened new opportunities for archeology in recent years, but so far, the analytical focus has been on single objects, on certain types of raw materials and on single archeological sites. However, as the methods of determination are steadily improving and as the number of analysis increases, studying the total quantity has large perspectives.

This potential is the focus of this presentation as part of the research project Raw materials throughout millennia – the geography of resources funded by the Ministry of Culture in Denmark. In the project, available material-based provenance analysis of objects dating c. 200-1200 AD found within the southern Scandinavian area are collected for general flow-analysis as well as detail studies of composite objects etc. The primary analytical challenge is not data diversity in terms of material-types or period, as this can be handled by means of classifications in the database and by selection of data in connection with specific analyzes. The main challenge is the mapping for analytical purpose without losing the dynamic and heterogenic nature of the data, as some provenances are relative to the places of finding (e.g. local or non-local), other provenances are precisely located, while many provenances cannot be located more precisely than to several possible and often larger regions.

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### REVEALING HIDDEN ASPECTS IN THE MEDIEVAL SIEGE OF ALCALÁ LA VIEJA (MADRID, SPAIN) THROUGH THE ANALYSIS OF A LIMESTONE PROJECTILE

**Author(s):** Ramirez Galan, Mario (University of Portland)

**Format:** Oral

It is complicated to discover archaeological artifacts associated with a siege. Usually, sieges do not leave archaeological traces: most elements were made with perishable materials, mainly wood. The finding of projectiles is an exceptional event. It is the opportunity to obtain a better knowledge about that military conflict.

In 2017, a set of four limestone projectiles were found in the surroundings of the medieval fortress of Alcala la Vieja. This Andalusian stronghold has been studied since the 60s, but all those previous works were not focused on the comprehension of the siege. Additionally, every other artifact related to the siege had been found during those excavations, decades prior.

After this discovery, two questions emerged: where were really trebuchets deployed? Where could armies obtain the raw material to make those projectiles? In order to solve these enigmas, the only available option was through an interdisciplinary study. The answers came through physical analysis and geographic information systems to locate potential trebuchet deployment areas, as well as XRF and Raman spectroscopy to know the exact composition of that limestone (and try to match it with limestone quarries in the area).

This work emphasizes the significance of interdisciplinary studies (spatial analysis, physics, geology, chemical analysis) when analyzing military conflicts.
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### WHERE IS THE FOCUS OF ATTENTION? AN EYE TRACKING STUDY OF STONE TOOLS

**Author(s):** Silva Gago, María - Fedato, Annapaola (National Research Center on Human Evolution - CENIEH) - Ioannidou, Flora - Hodgson, Timothy (College of Social Science, University of Lincoln) - Bruner, Emiliano (National Research Center on Human Evolution - CENIEH)

**Format:** Oral

Humans are obligatory tool-users. Our culture and cognition are tool-dependent, and a co-evolution between brain and technology is expected. The parietal cortex is crucial for the integration between body and tools. Simply watching a tool does stimulate the motor cortex and triggers action plans according to its implicit affordances, even when there is no intention to act with it. Also, humans integrate objects in the body scheme when handled. Actually, when a tool is touched, it is included in the personal space and it induces an expansion of the peripersonal space. Traditionally, tools have been interpreted as the output of the evolving cognitive system, while more recent hypotheses suggest that they can be a functional part of the cognitive network. Vision is the first input channelling action and body-environment relationships, particularly influencing attention engagement. We have applied eye tracking technology during visual exploration of Paleolithic stone tools, as to investigate salient their visual features and to find differences between different morphotypes associated with early hominids. Our results suggest that worked pebbles require more attentional burden than handaxes. The main focus of attention concerns the center of the upper half of the tool for the former technology, and on the midline for the latter. Attention is influenced by the width of the base in worked pebbles, and by the oval shape in handaxes. Knapped surface triggers more attentional exploration than natural cortex. These visual patterns are directly related to the tool’s affordances, and can supply information on the brain-tool evolutionary relationships.
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### LOWER PALEOLITHIC STONE TOOL HAPTIC EXPLORATION AND SEXUAL DIFFERENCES IN ERGONOMICS AND FINGER FLEXION

**Author(s):** Fedato, Annapaola - Silva-Gago, María (Programa de paleobiología, Centro Nacional de Investigación sobre la Evolución Humana, Burgos) - Terradillos-Bernal, Marcos (Universidad Internacional Isabel I de Castilla, Burgos) - Alonso Alcalde, Rodrigo (Museo de la Evolución Humana, Burgos) - Bruner, Emiliano (Programa de paleobiología, Centro Nacional de Investigación sobre la Evolución Humana, Burgos)

**Format:** Oral

Cognitive archaeology combines different discipline in order to gather information about our ancestors' behavior. In this context, material culture plays a pivotal role as an indicator of technological complexity and cognitive capacities. Stone tools are the most representative and complete archeological items, when dealing with Paleolithic cultural evolution. In the present survey, we investigate ergonomic and haptic variables involved in stone tool grasping, specifically when handling handaxes and worked pebbles. Grasping an object requires a combination of both biomechanical and cognitive components. The body (and in particular the hand) creates an ergonomic boundary with the handled object, and the two elements (the hand and the tool) became a single functional unit. The way in which we interact with objects can be analyzed from various perspectives and with different approaches. Some are more direct (like the study of the biomechanics of the hand) while others are more related to sensing and cognitive feedback

11 (integration of the tool into the body schema). In previous works, we described sexual differences associated with stone tool haptic exploration and electrodermal reactions, suggesting different patterns of arousal or attentional response. These differences are apparently not associated with differences in hand size. Here, we take into consideration sexual differences associated with ergonomics and stone tool handling. In particular, we evaluated the finger joint flexion of 82 subjects during the haptic exploration of handaxes and worked pebbles. Differences between males and females are significant for both stone tool type, although with distinct grasping patterns.

TOWARDS A RESEARCH AGENDA FOR STONE STUDIES

Author(s): Lyes, Christopher (University of Oxford)

Format: Oral

Four decades ago, Colin Renfrew spoke of a Great Divide. An opposition between European descriptive archaeology and American anthropological archaeology: ‘there is, therefore, a brilliant opportunity for anyone who can command the data and scholarship of the Great Tradition while employing the problem-orientation and research methods of current anthropological archaeology’.

Whether Renfrew’s dichotomy has been bridged remains a question for debate, though from the perspectives of social scientists and those in the humanities, scientific approaches to archaeology can appear distant, confusing and aloof. Whilst it certainly has the capability to answer questions of real archaeological significance, all too often, science-led archaeology ‘betrays a lack of consensus about what the major current questions in the discipline truly are.’ The lack of a strategic approach to academic study has seemingly broadened Renfrew’s dichotomy into an opposition between grand theory and abstract empiricism. Where the first ignores real-world problems in favour of theoretical models, and the second focuses on provenance studies, methods and data—the limited study of small-scale questions that remain isolated from their larger context.

It will be argued, therefore, that an epistemologically-aware, yet practice-focused response, deriving from a sound strategic-framework, is lacking. And that such strategized approaches need to be extended into the sub-disciplinary level in order to provide this response. We shall explore this further by addressing ourselves towards a single, multi-threaded sub-discipline—the study of stone in antiquity. Seeking to learn from successes elsewhere, we shall explore the need for, and the route towards, a more coordinated and strategic approach in this field, one that bears the potential to promote research networking, partnerships, context, and capacity. An approach that is mutually supportive of different strands of enquiry rather than conflicting, and one that is as concerned with interpretation and synthesis of existing data, as with new data collection.

503 GENERAL SESSION - HUMAN-ANIMAL RELATIONSHIPS

Theme: 5. Theories and methods in archaeology: interactions between disciplines

Chair: Bartosiewicz, László (Stockholm University)

Format: Regular session

ABSTRACTS

1 INTERDISCIPLINARITY TO AID ARCHAEOLOGICAL ANALYSIS OF ANIMALS IN EGYPT AND NEAR EAST

Author(s): Gransard-Desmond, Jean-Olivier (ArkéoTopia, une autre voie pour l’archéologie)

Format: Oral

Any scientific study requires data from outside the researcher’s precise field of work. Archaeology is amongst the scientific disciplines most frequently calling upon a multitude of other disciplines, both scientific ones and crafts. In this way, art history or iconological approach involving identification, description and image comprehension give new informations to archaeology. This case shows interdisciplinarity as producer of an actual new form of knowledge.

This presentation will present

A. why iconology and archaeology are differents disciplines because their topics are not the same : images in the first case and techniques in the second case,

B. how an interdisciplinarity approach is useful to better understand an archaeological topic thanks to an iconological approach dealing with:

- Canine farming techniques in pre-pharaonic times in Egypt from the 5th millennium BCE and suidae farming in the Middle-East during the 1st millennium BCE,
- Technicians’ (farmers’) movement between the Middle-East and Egypt during the 5th millennium BCE.

2 ORNITHOMORPHIC IMAGES IN THE UPPER PALEOLITHIC (MAL’TA BURET’ CULTURE, SIBERIA)

Author(s): Pankina, Anna - Lbova, Liudmila - Kazakov, Vladislav (Novosibirsk State University)

Format: Oral

The most antique bird images in the archaeological record belong to the Upper Paleolithic sites such as Hohle Fels, Dolní Věstonice,

Mezino, Mal’ta and Buret’. The largest collection of ornithomorphic sculpture is represented in the materials of the Mal’ta Buret’ culture (Baikalia, Northern Eurasia). This collection includes 21 items of figurines of water birds.

Numerous investigations of the ornithomorphic sculpture and analysis of the bird image semantic are based usually on the ethnographic parallels. One interpretation is that those figurines were personal amulets, used as pendants and related to solar and celestial symbolic (Formozov, 1980; Shmidt, 2006).

Modern researches offered a new look at the question about the interpretation of this collection with the application of microscopic and trasological analysis and analysis of the archaeological context (Lbova, Volkov, 2015). A historical semantic approach explains the meaning of the archaeological artifact through the understanding of the process of its fabrication and use.

Technological analysis of the collection allows differentiating the blanks of figurines and objects of various degrees of completeness. A steady correlation of the initial workpiece with the final look of the object is noted, which proves the absence of a random nature in the production. The traces of use have an uneven distribution in the finished products - from complete absence to the marks of use of the figurine even after breakage. The likely multifunctional use of the sculptured pieces is confirmed by the planographic features.

These provisions allow us to call into question the hypothesis (Formozov, 1980) of the identity of the semantic and functional purpose of the ornithomorphic figurines from the Mal’ta-Buret’ culture. They also offer an understanding of this collection as a long-time tradition of specialized figurine fabrication, which had different functional orientations.

This work is supported by the Russian Science Foundation (project 18-78-10079).

3 THE PATHWAYS OF HUMANS AND ANIMALS IN THE EARLY NEOLITHIC BALKANS: AN ARCHAEOZOOLOGICAL PERSPECTIVE

Author(s): Zivaljevic, Ivana (BioSense Institute, University of Novi Sad) - Dimitrijević, Vesna (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade; BioSense Institute, University of Novi Sad) - Stefanović, Sofija (BioSense Institute, University of Novi Sad; Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Format: Oral

Over the last couple of decades, extensive archaeozoological and aDNA studies have securely placed the origin of animal domestication in the Middle East. From this area, humans and domesticated animals (sheep, goat, cattle and pig) gradually spread to the Balkans, and ultimately to the rest of Europe. Nevertheless, the faunal record from the Early Neolithic (c. 6500–5500 cal BC) sites in the Balkans indicates that this process had been far from uniform. There seem to have been pronounced regional differences in herding strategies, mainly between the southern parts of the Balkan peninsula, and its central and northern parts, bordering with the Great Pannonian plain. In the former, animal husbandry was mainly oriented towards caprovines, whereas in the latter, in addition to sheep and goat, cattle husbandry played a more significant role. In this paper, we present new results of the analysis of faunal assemblages from Early Neolithic sites in Serbia and North Macedonia, the latter representing an area which had previously been insufficiently studied from an archaeozoological perspective. By comparing taxonomic compositions and mortality profiles of domestic animals in the two studied regions, we aim to provide additional insights into different animal husbandry practices, and look into possible reasons for this divergence – adaptations to new environments, cultural attitudes to various animals, and/or adherence to particular traditions.

4 SPATIAL BEHAVIOR OF MAMMOTH HUNTERS OF EPIGRAVETTIAN MEZHRYCH CULTURE IN MIDDLE DNIEPER BASIN (UKRAINE)

Author(s): Shydlovskiy, Pavlo (Taras Shevchenko National University of Kyiv, Ukraine; Center for Paleoethnological Research) - Péan, Stéphane (Muséum national d’histoire naturelle, Paris) - Tsvirkun, Ostap (Institute of Archaeology, National Academy of Sciences of Ukraine; Center for Paleoethnological Research) - Chymyrys, Marharyta (Taras Shevchenko National University of Kyiv; Center for Paleoethnological Research) - Mamchur, Bohdan (University of Ferrara; Center for Paleoethnological Research)

Format: Oral

In recent years, the Epigavettian site of Mezhyrich in the Middle Dnieper region, has been continuously studied, including the fourth mammoth bone dwelling, which was discovered in 1978 and left in situ for future research.

The complexity of the dwelling cultural layer reveals several surfaces of residence; in addition, a functional specialisation of areas and objects within the dwelling, associated with the processing of flint, animal bones and skins has been identified. The structural features of the building are characterized by symmetry and rhythmicity in the use of large mammoth bones, which makes up the basement of structure, exterior cladding and upper roof overlap that fell inside. The archaeological structures around the dwelling have different economic specificities (processing areas, workshops, pits, outer hearths, areas of a rich cultural layer). In total, four units each one being composed of a central dwelling have been discovered since the site was opened.

In addition to the base camps with mammoth bone architecture (Mezhyrich, Gontsy, Dobranichivka), a number of short-term sites, kill-sites and localities of Late Pleistocene fauna have been investigated in the Middle Dnieper. The technological analysis, together with the radiocarbon data, show that the sites of the so-called “Mezhyrichian culture” are the remnants of the activity of a single society that lived in a rather limited territory 15-14 ka 14C BP. This conclusion provides a unique opportunity to reconstruct some



5

## NON-ECONOMIC USE OF ANIMALS IN THE EARLY IRON AGE CENTRAL BALKANS: THE CASE OF THE ŠLJUNKARA –ZEMUN SETTLEMENT

**Author(s):** Bulatovic, Jelena (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Spasic, Milos (Prehistoric Collection, Department of Archaeology, Belgrade City Museum)

**Format:** Oral

The presentation aims to discuss the role of animals in non-economic activities in the settlement of Šljunkara in Zemun (Serbia), as well as, among the Early Iron Age societies along the Danube. This site is located on the wide loess plateau on the right Danube bank, in the vicinity of Belgrade. It was founded around the beginning of the first millennium BC. In a cultural-historical sense, it was connected with Kalakača/Bosut IV communities. The Šljunkara – Zemun settlement consisted of several solid above-ground, rectangular, wattle and daub houses, pits and siloi. A special deposit with a male aurochs head was discovered in the pit connected with one of the investigated burnt houses. Animal remains used in rituals connected with house foundation and abandonment will be discussed in the context of the similar practices observed at other Early Iron Age settlements of the central Balkans and adjacent areas. Questions of the symbolic and ritual value of cattle among the Šljunkara community will be addressed also to reveal profound bond between people and animals in the Early Iron Age Europe.

6

## HUNTING FOR THE MYCENAEANS

**Author(s):** Georgiadis, Mercourios (Institute of Classcial Archaeology in Catalunya)

**Format:** Oral

Hunting had been an additional source of subsistence in many agropastoral societies. The current paper aims at understanding the degree hunting played in the everyday life of the Mycenaean society as well as in religious events like rituals and sacrifices. There will also be an assessment of the symbolic role hunting played in iconography for the elites. Hunting scenes are frequent in the glyptic art of the time, on seals both of semi-precious stones and gold. They consisted of a large theme among them, arguing about the popularity they had among the Mycenaeans that commissioned and used them. Furthermore, they are found inlaid on weapons, like swords, suggesting that there was an interrelation to warfare as well. In this context the depictions and the examples of special care dogs received can be added to the importance attributed to hunting. The preference for this type of scenes in palatial complexes as fresco paintings on walls promoted the ideal of the elite and the king/wanax as a successful hunter. These representations will be analysed and discussed within their sociopolitical context, whilst their archetypal images in Egypt and Mesopotamia will be sought. The relation of the Mycenaeans with the wild animals can provide a deeper insight of the role they were considered to have in everyday life and on the symbolic level for the LBA societies of the Aegean.

a.

## STUDY OF THE IDENTITY OF A BRETON MAMMOTH FROM ATTENED TUSK PIECES TOMOGRAPHY

**Author(s):** Barreau, Jean-Baptiste (Univ Rennes, CNRS, CReAAH UMR 6566, Rennes) - Le Maire, Mikaël - Bourbouze, Gaël (CRT Morlaix)

**Format:** Poster

Numerous marine transgressions and regressions have been taking place in the Western English Channel with sea-level as low as -50m in the Normano-Breton Gulf and the Bay of Saint-Brieuc. This phenomenon created new areas of land and was at the origin of the development of the mammoth steppe, tundra and taiga. The “site des Vallées” in Pléneuf-Val-André (Brittany, France), delivered Elephantidae, horse (Equus caballus), fox (Vulpes vulpes) and a large bovine bones. Five attened sections of a large tusk are kept in the Archaeosciences Laboratory at the University of Rennes 1. A first visual study evoked the hypothesis of an ancient elephas antiquus but without certainty. The objective of our work is to check whether a study of internal structures by tomography can confirm this hypothesis, and possibly say more about the animal's identity. Before any anatomical consideration and even if the parts were crushed by several millennia of taphonomic pressure, we wanted to test a virtual assembly. First, we scanned the blocks using a 3D scanner. The anastylis attempt was made with a point cloud processing software. Given the loss of material, only the first blocks seem to be able to fit together. At the same time, we used a high-resolution tomograph to scan the inside of the blocks. We were able to explore some internal structures in 3D. Thanks to the morphometric study of the Schreger angles inside the tusk, it is possible to determine the proboscidean taxon. The first anastylis attempt made it possible to submit several 3D renderings to different specialists in Paleolithic mammals. Despite the lack of matter, it would seem that the animal was a large male. Age determination using some structures currently seems difficult, but we have succeeded in isolating the first tubular structures which may lead to the determination of the taxon.

504

## GENERAL SESSION - HERITAGE IN FOCUS

**Theme:** 3. Sustainable archaeology and heritage in an unsustainable world

**Chair:** Wollak, Katalin (Independent researcher)

**Format:** Regular session

## ABSTRACTS

1

## UN-INSPIRED: WHERE IS THE SPATIAL DATA INFRASTRUCTURE FOR HISTORIC ENVIRONMENT DATA?

**Author(s):** McKeague, Peter (HES - Historic Environment Scotland)

**Format:** Oral

The INSPIRE Directive (2007), transposed into national legislation across the European Union in 2009, requires member countries to share environmentally-related datasets by public organisations within their own and neighbouring countries for the purposes of Community environmental policies and for policies or activities that may have an impact on the environment. These activities are coordinated through national Spatial Data Infrastructures (SDIs) which provide the framework, coordination, standards and technical specifications for publishing data relating to thirty four broad data themes.

Despite the environmental focus of INSPIRE, archaeological and cultural heritage data is largely overlooked – only directly addressed through the ‘Protected Sites’ theme. There is no requirement to collate and share the wealth of primary spatial data created every year across Europe through a range of techniques from survey to excavation, for the benefit of the discipline. Instead we tend to persevere with project-focused approaches that fossilise valuable spatial data to the printed page or PDF rather than collating data in reusable formats that adhere to common standards. All too often the underlying data is retained by the researcher, lost or stored in an archive, ill-suited to long-term digital preservation.

Issues of archiving are being addressed through the Saving European Archaeology from the Digital Dark Ages COST Action, whilst the ARIADNE Infrastructure project has established a Digital Infrastructure for research archaeology across Europe. However, neither initiative directly addresses realising the value of the spatial data we create and need to reuse.

We need to follow the example of other disciplines such as geology or the marine environment, in developing a thematic SDI for the wealth of spatial data we create through primary research and scientific analysis. Digital transformation of established practices can deliver efficiencies in our process and unlock the potential of our spatial data in the emerging geospatial economies.

2

## ARCHAEOLOGICAL RESEARCH FOR THE PROMOTION OF CULTURAL EDUCATION AND RURAL TOURISM - THE LEBANON MOUNTAIN TRAIL CULTURAL HERITAGE PROJECT

**Author(s):** Fares, Alia (Lebanon Mountain Tral Association; University of Cologne)

**Format:** Oral

The western mountains of Lebanon contain hundreds of archaeological and ancient cultural heritage sites dispersed between its valleys, on mountain tops, next to river beds and in the midst of far-away villages. In 2007, the Lebanon Mountain Trail association was created to promote a 470 km hiking trail extending along this mountain range (www.lebanontrail.org). To study its immense heritage, a project was begun, aiming to achieve a complete database of all the sites. This initial database, in collaboration with the Lebanese Department of Antiquities, will in turn become the basis for future scientific study for interested researchers. Some examples, such as ancient oil and wine presses, antique roman temples, deserted byzantine/medieval churches, rock-cut burial chambers and sarcophagi, as well as deserted ancient silk factories were inserted into various technical datasheets. Site preservation recommendations, info panels and preservation techniques were developed with an educational task while collaborating with the diverse municipalities around and creating cultural heritage awareness in the 75 villages found along the trail. This led to further opportunities in those communities in the tourism sector, new restaurants around the sites, guest houses, and many educational trips with cultural hiking experiences. The project became a collaboration with the local communities of the mountains, empowering them in turn and allowing them to feel responsible for their heritage, in order to preserve it for future generations to come. The villagers became leaders of a sustainable authentic form of tourism that is just beginning to rise in Lebanon.

3

## COMMUNITY ARCHAEOLOGY AND HERITAGE PRESERVATION IN THE AFTERMATH OF THE SECOND WORLD WAR. THE CASE OF MODERN RUSSIA

**Author(s):** Voronov, Oleg (Volksbund Deutsche Kriegsgräberfürsorge e. V.)

**Format:** Oral

No historical event changed Russian society more than the Second World War. Every aspect of the lives of the Russian people has been affected by the global conflict. Many physical signs of the war have survived – a vast array of sites and artifacts that archaeologists can now explore. But archaeologists are not the only ones interested in the subject.

The Russian “Search movement” emerged in the 1970s as a grassroots initiative. At that time forests, swamps and steppes of the Soviet Union were literally stuffed with human remains. By the early 2000s and especially after Moscow’s standoff with the West

over Ukraine in 2014, President Vladimir Putin has portrayed his policies as patriotic defiance against “fascist” aggressors. These days, turning to the Second World War legacy is one of the Kremlin’s tools to centralize power. One of the consequences was that the Russian search groups began receiving wide-ranging state support.

This alone would not be a problem, if the soil along the former frontlines in western Russia would only hold the mortal remains of the WW2 soldiers and the associated finds. However, all these places, from Murmansk to the Black sea are rich in archaeology with periods going as far back as the Paleolithic era. And, on top of the pressing problem of the tomb raiders in Russia, the Search movement participants innocently or negligently are destroying archaeological monuments on a yearly basis. Due to current government support, they are usually getting away with it, even in cases when caught red-handed.

During the presentation, the possible ways of dealing with this problem will be discussed, based on the cooperative work between the German War Graves Commission (a nonprofit German organization excavating the German war dead in the former Soviet Union) and the Russian cultural heritage institutions.

4

ARBITRARINESS

Author(s): Almansa-Sanchez, Jaime (Incipit, CSIC)

Format: Oral

Decision-making in archaeological heritage management affects every aspect of the cycle, from education to access, even though we usually see only the most evident or urgent aspects of this matter. In the context of the project #pubarchMED, which aims to better understand archaeological heritage management in the Mediterranean context, one issue appeared worryingly: in most countries, in most occasions, decisions did not follow a clear protocol or standard, but were biased by the person who set the agenda or, in the worst scenarios, officers following their own instinct or will, creating a climate of insecurity and a perception of arbitrariness that makes no good to the profession, or the discipline.

Following the areas of improvement identified by the EAC survey, this paper aims to explore possibilities in a context that makes standardization difficult. Different management models, different needs and priorities, conflicts or politics and policy shifts, are just some of the determining factors. Following some examples from the results of the project, and focusing only on the European side, some of the contradictions and difficulties will be questioned with the aim to overcome them and find common ground.

5

NO MORE POLLUTER PAYS PRINCIPLE. OPPORTUNITIES AND CHALLENGES OF PUBLIC BENEFIT PROVISION IN UK DEVELOPMENT-LED ARCHAEOLOGY

Author(s): Aitchison, Kenneth (FAME - Federation of Archaeological Managers and Employers)

Format: Oral

The overwhelming majority of archaeologists working in the UK work in commercial, development-led and developer-funded archaeology. The work these people do is for the public benefit.

FAME, the Federation of Archaeological Managers and Employers, is the trade association for those organisations, the commercial companies that carry out this work in the UK and the Republic of Ireland. The association has existed since 1975 and FAME’s Vision Statement sets out that the association wants:

“To strive for a business environment where archaeological organizations can operate safely and sustainably, the well-being of employees is prioritised and archaeologists feel empowered to build careers and expertise, so that collectively we can conserve and advance knowledge of the past for the benefit of society.”

The last phrase is key. This may be a business association, but it is very much focussed on delivering public value.

FAME members work in partnership with local government archaeological advisers who ensure that every project is aligning with public benefit requirements, and in partnership with their clients. Every commercial archaeology project is a partnership project and every commercial archaeology project is a public benefit project.

Commercial archaeology in the UK no longer operates under the concept of the ‘Polluter Pays Principle’ – the legacy of environmental economic theory that underpinned the earliest legislation and guidance, an assumption that the requirement to fund archaeological work is seen as a (legal) ‘remedy’ for the consequences of economic development. The developers are delivering public benefits, and archaeologists are working in partnership with them.

This paper will use high profile case studies (A14 Cambridge to Huntingdon Improvement Scheme, Bloomberg London and Crossrail) to showcase how commercial archaeology in the UK is delivering public benefit through partnerships between developers, FAME members and ALGAO advisors to local government.

6

BRINGING A RUIN TO LIFE WITHOUT BEING RUINED - PROJECTION BASED IMMERSIVE EXPERIENCES ON A SMALL BUDGET

Author(s): Lindbäck, Viktor (Riksantikvarieämbetet - Swedish National Heritage Board)

Format: Oral

My presentation, based upon my own experiments and experiences, deals with the benefits of projection-based on-site immersive experiences, as a cost-efficient, flexible, non-invasive and creative way to make the past visible and comprehensible. My presenta-

tion also gives examples of how archaeological records can be made accessible and understandable to the public (thus raising the awareness of the need for protection of cultural heritage sites) through projection-based visualizations.

Digital immersive experiences, through VR, AR and projections, can be used to curate non-visible cultural heritage, and are now becoming more widespread and integrated in the public work of museums and institutions. Therefore, the Swedish National Heritage Board is putting together a best practice for immersive experiences, aimed at museums and cultural heritage institutions. As a part of this work, I am carrying out a practical experiment with a projection-based on-site reconstruction of a 13th century church ruin in Visby. The aim of this experiment, in cooperation with the Gotland county museum, guides, artists and animators, is to try out and showcase simple and low-cost technical solutions for projection-based immersive experiences. The experiment also emphasizes the creative and artistic aspects of making an aesthetically interesting interpretation of fragmentary or non-visible cultural heritage.

My presentation has a practical, hands-on approach on the subject, with lots of documentation of my experiments, as examples of how artistic interpretations of the past can be integrated with and enrich cultural heritage sites. The church ruin in Visby used for the experiment bears few traces of its original splendor and use, and visualizations of stained glass windows, frescoes, a hypocaust heating system, roof and spires, will be used together with music, sounds, smells, projected 3D-models of artifacts and buildings, human guides and projected ghost guides, to create atmospheric multi-sensory and truly immersive experience.

7

ARCHAEOLOGICAL HERITAGE PROTECTION AND MANAGEMENT IN THE BALKANS

Author(s): Lafe, Ols (University Aleksandër Moisiu, Durrës)

Format: Oral

In recent decades, the various ways archaeological heritage protection and management are handled in the Balkans have changed drastically, as they have elsewhere in Europe. In this chapter, I discuss both the Valletta and Faro conventions, and the concepts of preventive archaeology and heritage communities, which have encouraged a more holistic and participatory approach to heritage managment. This chapter aims to analyze the legal approach to heritage taken by Balkans countries, as well as the implications these approaches have on the ground, when implemented. Notable successes and ‘spectacular’ failures in the protection of archaeological heritage sites will both be considered, in order to enhance further our understanding of the past, but also to suggest solutions to the problems that will face our common heritage in the future.

The contrast often made between scientific (or academic) versus development (or professional) archaeology will be described and discussed, and how both are perceived in the Balkans will be analyzed, with the aim of describing the many different approaches taken by different countries when it comes to dealing with their archaeological heritage.

The management of archaeological heritage sites is another important issue dealt with in this chapter, and an investigation into existing management plans from different Balkan nations will be conducted. Are there similarities in the ways each government sees the potential of archaeological sites? What role do management plans play in the protection of archaeological resources and, most importantly, are they effective against the illicit trade in artifacts, a phenomena which has plagued the Balkans for quite some time? In conclusion, we need to be concise, fair, and even when dealing with the past, as any mistakes we make today will have unforeseen consequences in the future.

8

HERITAGE AND THE CONSTRUCTION/DECONSTRUCTION OF NATIONAL BORDERS: THE REDES ANDINAS EXPERIENCE

Author(s): Saintenoy, Thibault (Incipit-CSiC)

Format: Oral

As an instrumentalization of the past, heritage has contributed to the making of many national borders. Reciprocally, borders have often conditioned heritage-making. Also, it should be noticed that borders are not necessarily the product of cultural discontinuities, although once constructed, they form spatial devices that actively participate in the production of otherness. In other words, borders are definitely more performative devices, than spatial products of cultural dynamics.

Redes andinas is an ongoing ethnoarchaeological project that researches the history of mobility practices and multizonal settlement systems in a highland Andean region. Since the end of the XIXth century, this region is crossed by a line dividing Bolivia and Chile. This line on the map is materialized, on the field, by milestones, landmines and border posts, but also by centuries-old cairns, smugglers footprints and transborder informal marketplaces. The archaeological perspective allows us to understand the material diversity and agency of borderland devices that shape people’s mobility through the landscape. Moreover, it allows us to think how heritage may not only divide, but also draw alternative lines.

a.

MINEHERITAGE PROJECT: HISTORICAL MINING – TRACING AND LEARNING FROM ANCIENT MATERIALS AND MINING TECHNOLOGY

Author(s): Angelini, Ivana (Department of Cultural Heritage, University of Padova) - Canovaro, Caterina - Nimis, Paolo - Artioli, Gilberto (Department of Geosciences, University of Padova)

Format: Poster

MineHeritage is a Wider Society Learning project that intends to promote Mining and Raw Materials to create popular educational tools for the dissemination of Raw Materials importance through historic periods. The MineHeritage Consortium consists of 13 Eu-

ropean partners, including Universities and CNR laboratories, and aims to encourage school age children and young adults to explore raw materials, their technological development and cultural tourism using a web based multilevel game and an Application for mobile devices (App). The main goal of the project is the development of a comprehensive roadmap of mining and use of raw materials since Prehistory, linking European regions to commercial routes of raw materials used through time.

In the present work, the construction of the database, hosting all the information assembled by the Consortium, will be presented. The objective of this work is to make available all relevant information on selected historical sites related to mining activity in each of the countries of the European partners participating in MineHeritage project. Via this database, all partners participating will make available the information on ancient mining sites, abandoned mines, classified heritage sites related to mining, etc. All relevant information used to build up the database, will be available for the production of the dissemination materials and included in the game and App, so to create a virtual tour of ancient European mine heritage.

b. **DEVELOPMENT OF AN ACTIVE LEARNING METHOD TO UNDERSTAND ARCHAEOLOGICAL PHENOMENA IN THE HELLENISTIC AND ROMAN PERIODS**

**Author(s):** Makino, Kumi (Kamakura Women’s University) - Takami, Tae (The Ancient Orient Museum Tokyo)

**Format:** Poster

This study focuses on an elaboration of the active learning methods for understanding ancient history and archaeological phenomena. The basic concept comes from the ancient city model project of Ur in Iraq conducted by Tae Takami of the Ancient Orient Museum of Tokyo. The project is designed mainly for children to learn about the ancient city. Makino, with the support of M. Eisenberg, the director of the Hippos excavation at the Zinman Institute of Archaeology at the University of Haifa, applied this method among the university students to study the Hellenistic and Roman settlements discovered at the ancient site of Ein Gev in Israel and the vicinity of the Hippos site.

Known as ALMAP tentatively, this is an undergoing project for college students to make models of the ancient buildings discovered from these two sites. Students try to read the published excavation reports and make models of the city (SCMOD 1:500) and each building (SCMOD 1:100). For young Japanese students, the study of classical history and archaeology of Israel is a faraway phenomenon. Side-by-side photos and figures in the excavation report along with the relevant data from their daily life, such as entertainment, household, shopping, school, etc., lead them to new insights towards the interpretation of the archaeological phenomena.

The model-making project makes it easier to compare the different types of cultures in the world and analyse them from a broader perspective using daily life experiences. This study also enhances students’ motivation to learn more about historical backgrounds. This method is not limited to the archaeology of ancient Palestine in the Hellenistic and Roman periods, but can be applied to any period or field. We hope that further studies will broaden the range of active learning methods and get into the ancient people’s mind.

**505** **GENERAL SESSION - WATERSCAPES**

**Theme:** 4. Waterscapes: archaeology and heritage of fresh waters

**Chair:** Hafner, Albert (University Bern)

**Format:** Regular session

**ABSTRACTS**

1 **NEOLITHIC WELLS IN MORAVIA IN THE LIGHT OF RECENT ARCHAEOLOGICAL AND ENVIRONMENTAL RESEARCH**

**Author(s):** Kalabková, Pavlína (Palacký University Olomouc) - Vostrovská, Ivana (Palacký University Olomouc)

**Format:** Oral

The discoveries at Mohelnice in Moravia (Czech Republic) in the early 1970s have started the exploration of Neolithic wells of the Linear Pottery Culture in Europe. Besides unique archaeological findings also the first environmental analyses were made, which helped to reconstruct the natural conditions at the beginning of the Neolithic Period. After an almost fifty-year-long research we can now compare and update the achieved results. The paper presents the results of excavations of Neolithic wells at Mohelnice, Brno – Bohunice and Uničov in Moravia. It compares the building techniques used with individual wells, construction types, the way of use and decline, movable archaeological finds and the results of environmental analyses leading to reconstructions of natural environment on individual sites and on the whole territory of Moravia. Results of dendrochronology and radiocarbon dating, trasology, lithostratigraphy, palynology, anthracology and xylotomy, plant macroremains and mosses, zoology and entomology will be presented. Subsistence strategy of the first farmers in Moravia will be presented.

2 **CHANGES IN ECOSYSTEM AND THEIR CORRELATION WITH NEOLITHIC WETLANDS INHABITATION (NW RUSSIA)**

**Author(s):** Dolbunova, Ekaterina (The State Hermitage Museum; The British Museum) - Kittel, Piotr (University of Lodz) - Mazurkevich, Andrey (The State Hermitage Museum) - Wieckowska-Lüth, Magda (University of Kiel) - Pawłowski, Dominik (Adam Mickiewicz University) - Gauthier, Emilie (UMR CNRS 6249) - Krąpiec, Marek (AGH – University of Science and Technology) - Maigrot, Yolaine (UMR 8215 Trajectoires) - Szymańska, Jacek (Pedagogical University of Cracow) - Mroczkowska, Agnieszka (University of Lodz)

**Format:** Oral

The paper shows the results of interdisciplinary study on cultural layers from Neolithic wetland multilayer site, Serteya II (NW Russia) with several periods of occupation. A set of palaeoecological analysis for organic deposits core were employed, including: pollen, plant macrofossils, charcoal, fish remains, Cladocera, Chironomidae, geochemistry, sedimentology and AMS radiocarbon dating to identify the principal environmental conditions, which attracted the Neolithic communities there between ca. 4300 and 1600 BC. The Neolithic occupation occurred here at Serteya within a very vivid waterscape milieu, changing from lacustrine conditions, swampy areas and to riverine system. The natural conditions were characterized by a high level of landscape geo- and biodiversity, the development of Neolithic settlement was mostly depended on hydrological and vegetation changes, which influenced the availability of natural resources. The distinct impact of communities using non-productive economy on ecology of the palaeolake shore zone of the palaeolake was recorded. On the other hand, the paleolake level changes in the shore zone influenced palaeoeconomic activity of local Neolithic societies such as gathering of plants (as dietary component and for medicinal using), fishing activities, and probably may also have been important for funeral practices. The identified phases of high water level changes were correlated with supraregional climatic events - these were respond to climatic oscillations, especially on ca. 6.2, 5.9 and 4.2 ka cal. BP.

3 **MULTISCALAR PERIODICITY IN PREHISTORIC WETLAND SETTLEMENTS: A VIEW FROM SOUTHERN ALBANIA**

**Author(s):** Allen, Susan (University of Cincinnati)

**Format:** Oral

Archaeological, palaeoenvironmental, and palaeoethnobotanical research in the vicinity of the former Maliq wetland in southern Albania reveals a long history of wetland settlement and dynamic shifts in lake configuration from ca. 6,500 BC to the present. In this paper, I examine archaeobotanical data for the Early Neolithic site of Vashtëmi and the Neolithic to Early Iron Age lakeside settlement of Sovjan together with regional data concerning vegetation and geomorphic changes in order to consider recurring patterns of ecological variation and cultural behaviors at varied temporal and spatial scales, with a particular focus on subsistence, land-use practices, and settlement patterns. While Vashtëmi, excavated as part of the Southern Albania Neolithic Archaeological Project (SANAP), provides an example of an ephemeral village, the lakeside settlement of Sovjan, excavated by the Mission Archéologique Franco-Albanais du Bassin du Korça, exemplifies a more stable, long-lived settlement. At both sites, well-preserved plant remains attest to iterative processes of mutual adaptation between the wetland and people living on its margins.

4 **LIVING ALONG THE WETLANDS AND LAKES IN THE NEOLITHIC BALKANS**

**Author(s):** Naumov, Goce (Center for Prehistoric Research)

**Format:** Oral

The Balkans is commonly recognized as the mountainous region, but the valleys, wetlands and lakes are frequent landscape feature as well. Although not considered as significant as dryland areas in the archaeological research, the wetlands and lakes were preferred environmental setting in the Neolithic. So far, the discovered sites in several Balkan countries are far more frequent in the wetlands than on hills, mountains or slopes. The immensity of resources in such areas explains the preference of marshes, floated areas, lakes and rivers among the first farming communities in the Balkans. It was important for them to have constant approach to fertile soil, water, mud, reed and animals.

As result to solid access to resources and economic stability these agricultural societies established settlements that could last longer and maintain social and symbolic relationship with representatives of several generations. Consequently, the tells were introduced in the Early Neolithic wetlands where new houses were continuously built over the initial dwellings, so that the settlements gradually gained the mound like outlook. Regarding lakes the pile-dwellings were favored as they provided direct approach to water resources, but also protected the communities from wild animals or attacks. The defensive system was also developed in the tells where often ditches enclosed the settlements.

The presence of ditches and palisades indicates the necessity of property protection and accumulation of significant quantity of resources. The production of high quality pottery, tablets, house models and impressive human or animal representations demonstrates the economic standards and solid subsistence not commonly achieved by the communities dwelling in the hills, mountains and slopes. Consequently the wetland societies should be considered as significant contributors in the Neolithic networking and as one of those that brought economy and art to higher standards.



- 5

READING THE UNSEEN: ÓBIDOS LAGOON MARITIME CULTURAL LANDSCAPE

**Author(s):** Fraga, Tiago Miguel (Tiago Miguel Fraga Lda)

**Format:** Oral

Located in Portugal, Obidos Lagoon is the tributary of four rivers: Borralla, Cal, Arnoia and Real, and currently a small lagoon one ninth of its size. Since prehistory, Óbidos lagoon has been favourable to human occupation, and humans have had to adapt to an ever-changing landscape: from a prehistoric rich landscape for grazing, to a Neolithic body of water, harbouring a wealth of maritime resources, to a semi sheltered bay, with a port for the Roman City of Eburobrittium, to a present-day small bay suited for maritime leisure tourism. Inhabitants of its margins have had to reinvent themselves and their activities to cope with the alterations of their lagoon. Some of these changes are quite visible today, others remain in the hidden landscape of social memory, such as geographical names of ancient tower stations of the Roman Period, of shipyards and harbours of the medieval period, local expressions regarding fishing areas and the unique shipbuilding of the area. This has shaped a very specific culture in Mainland Portugal spanning more than five millennia.
- 6

FLOOD RISK OF AN ANCIENT RIVER. THE CASE OF THE SANCTUARY OF AMPHIARAOS AT OROPOS

**Author(s):** Androvitsanea, Anna (Technical University of Berlin)

**Format:** Oral

Identifying and interpreting the traces of an ancient water culture is a challenging task. In this paper, I study an ancient river with the use of an interdisciplinary approach, drawing from hydrological modeling and archaeological research in order to investigate the effect of sustainable flood risk management in ancient hydraulic infrastructures and contemplate on the awareness of flooding risks in antiquity. I focus on the sanctuary of Amphiaraos in Attica, located in a deep and steep-sloped gorge within which flows the river. Subsequent to extreme amounts of precipitation, the river would overflow its cross section and flood the surrounding areas, including the sanctuary. As the sanctuary is built next to the river, sustainable water management has been a concern, a fact attested to both by the archaeological remains and by inscriptions dated to the 4th century BCE. Using a simple hydrological model, I estimate the basin’s response to flooding events of different return periods. Conversely, using the Manning formula I calculate the flow rate that can be accommodated by the river’s cross section. Combining hydrological analysis with archaeological data, this paper casts some light into the natural conditions under which construction projects in the sanctuary had been designed and implemented.
- 7

AQUEDUCTS OPERATING IN THE GREATER KNOSSOS REGION

**Author(s):** Kelly, Amanda (University College Dublin)

**Format:** Oral

At the start of the 20th century, Arthur Evans observed that the Roman aqueduct of Knossos was followed by both Venetian and Turkish water systems, tapping water from an abundant spring in the eastern foothills of Juktas, and concluded that the Minoans were capable of doing the same (Evans 1903-4, 52-53). Evans envisaged a continuity of long-distance water exploitation from the Bronze Age through to the early modern period but never tested his hypothesis in the field. In 2019, we surveyed the Roman aqueduct supplying Knossos and, in doing so, also realised the extent to which this system was reused and adapted in the 19th century for the water supply of Heraklion. Our research led us to question why the Venetian administration did not follow suit but, instead, chose to tap a series of springs in the neighbouring valley for their gravity-flow system. This short presentation will showcase findings from our survey and present a range of considerations for such long-distance water conduction over time.
- 8

PLEISTOCENE ADAPTATION IN ISLAND ENVIRONMENTS AND THE CASE FOR HOMININ SEAFARING

**Author(s):** Strasser, Thomas (Providence College) - Holcomb, Justin (Boston University)

**Format:** Oral

The hypothesis that our hominin ancestors could consciously decide to cross open water has remained a central topic to anthropological discussion since the discovery of stone tool artifacts on the island of Flores. Traditionally only thought to be associated with H. sapiens, the age of the first seafaring activity has become increasingly earlier in recent years, opening the window to speculation about potential hominin seafaring activity. Taphonomic issues leading to the lack of direct evidence for seafaring means that archaeological evidence is largely relegated to stone tool finds on island archipelagos. In the last decade, nine discoveries from five different islands in the Eastern Mediterranean and Island Southeast Asia have provided impetus to revisit the hominin seafaring hypothesis. These finds have implications for the biocultural evolution of the genus Homo, and suggests that seafaring may be a new barometer for measuring human behavioral modernity. Here, we provide a summary of discoveries that support the early hominin seafaring hypothesis and speculate on the notion that these regions may be nurseries for seafaring. Specifically, because they are in biodiversity hotspots within tectonically active regions characterized by shifting paleogeographic configurations throughout the Pleistocene.

- a.

ASPECTS OF CISTERCIAN WATER MANAGEMENT IN MEDIEVAL HUNGARY

**Author(s):** Ferenczi, Laszlo (Charles University, Prague)

**Format:** Poster

Medieval Cistercians are commonly praised for their expertise in water management. This is manifest not simply in connection to how they organized monastic premises, but also in the broader region surrounding their monasteries. As known from the literature, Cistercian lands were typically centrally located (not dispersed), and the topographical layout of the estates facilitated large scale water management projects.

Careful site selection strategy was often paired with significant investment in altering natural conditions (e.g. draining, forest clearing etc.). Concerning Cistercians in Hungary (and more broadly in Central Eastern Europe), there is a limited knowledge on the landscape impact of Cistercian settlement. Archaeological investigations of Cistercian sites in the past typically had limited agenda, focusing primarily on the excavation of churches and claustral buildings. More recent investigations, however, applying landscape archaeological methods, yielded significant new data concerning water management (mostly on fish-pond systems).

The paper attempts to briefly outline some aspects of this theme, relying on archaeological and environmental data, in regard to site selection and the management of small streams, fishpond construction based on case studies from Hungary.

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GENERAL SESSION - MICROARCHAEOLOGY OF PAST BODIES

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Chair:** Cavazzuti, Claudio (University of Bologna; Museo delle Civiltà, Rome; Durham University; Consiglio Nazionale delle Ricerche)

**Format:** Regular session

ABSTRACTS

- 1

BIOLOGICAL KINSHIP AND INHERITANCE OF SOCIAL STATUS IN THE EARLY BRONZE AGE: PALEOGENETIC ANALYSIS OF THE MOKRIN NECROPOLIS IN SERBIA

**Author(s):** Žegarac, Aleksandra (Laboratory of Bioarcheology, Faculty of Philosophy, University of Belgrade) - Winkelbach, Laura - Blöcher, Jens - Diekmann, Yoan (Palaeogenetics Group, Institute of Organismic and Molecular Evolution - iomE, Johannes Gutenberg University Mainz) - Krečković Gavrilović, Marija - Porčić, Marko (Laboratory of Bioarcheology, Faculty of Philosophy, University of Belgrade) - Stojković, Biljana (Department of Genetics and Evolution, Faculty of Biology, University of Belgrade) - Veeramah, Krishna R. (Department of Ecology and Evolution, Stony Brook University) - Burger, Joachim (Palaeogenetics Group, Institute of Organismic and Molecular Evolution (iomE), Johannes Gutenberg University Mainz) - Stefanović, Sofija (Biosense Institute, University of Novi Sad; Laboratory of Bioarcheology, Faculty of Philosophy, University of Belgrade)

**Format:** Oral

The Early Bronze Age necropolis of Mokrin in Serbia (2100-1800 cal BC), which belongs to Maros culture, has a great significance for the study of kinship relationships and social organization. As the other necropolises of the Maros culture, Mokrin had a highly standardized funerary ritual: the deceased were laid to rest in a crouched position, arms bent at the elbows and facing east, while the position of the skeletons depended on the sex. The graves were equipped with various burial objects - from simple ceramics to golden jewellery, and previous studies have identified weapons and certain types of jewellery as status markers. Graves of the children followed the burial rituals of the adults and had similar grave goods.

Since the Early Bronze Age is a period of great social change, the study of biological kinship can be crucial when it comes to determining whether wealth and social status were inherited or achieved. By analysing the ancient genomic data of 24 individuals (14 adults and 10 children) from the Mokrin necropolis, we were able to identify nine family relationships. The analysis of biological relationships, together with anthropological (age and sex) and archaeological data (variation in the number and quality of grave goods), suggest that status was probably not inherited by male children, as it was previously observed in other Bronze age societies. With this study, we show that the inheritance of social status does not necessarily have to follow universal patterns, but may well show regional variations. This study also represents a stepping stone for future research of the social transformations in the Early Bronze Age of Balkans and Europe.
- 2

THE CHRISTIAN VIKINGS OF VARNHEM – AN ISOTOPIC ANALYSIS

**Author(s):** Wathen, Crista (Stockholms Universitet) - Vretemark, Maria (Västergötlands Museum) - Isaksson, Sven - Bengtsson, Fanny - Forsetløykken, Live - Colas Åberg, David - Roman, Emma - Eriksson, Gunilla - Lidén, Kerstin (Stockholms Universitet)

**Format:** Oral

One of the oldest Christian sites outside of Scania in Sweden is Varnhem, located in Västergötland, and with extensive remains dating from the Iron Age to the early medieval period. The Christianization of Sweden is suspected to have been a period of increased mobility and dietary variation so that the newly baptized could participate in a community with common religious values. The site contains a cemetery, a church, and abbey that demonstrate the area’s societal and religious transformation. For instance, the cemetery predates the earliest parish church, demonstrating a movement from the pre-Christian belief system. Additionally,

several phases of construction took place until the final abbey was built by Cistercian monks. According to archaeological and church records, there are several thousand individuals buried here. Of these, approximately 200 have been excavated and an even smaller portion has been analyzed for various isotopes to determine the dietary variation within the population. Continued analysis of the same individuals using  $^{87}\text{Sr}/^{86}\text{Sr}$  may shed light on their migratory history, therefore, giving an overview of the migratory and the dietary-history of the site.

3 **ORGANISING CHAOS: EXPLORING 3D DIGITAL DATA CAPTURE FOR UNRAVELLING COMPLEX DEPOSITS OF HUMAN REMAINS IN MASS GRAVES**

**Author(s):** De Simone, Samantha (Bournemouth University)

**Format:** Oral

The key to unravelling a sequence of events when excavating human remains, in both traditional and forensic archaeology, is the accurate recording of the spatial relationships between the remains and their context. The destructive nature of the excavation process necessitates that once artefacts and other evidence are removed from the scene the relationships between them are lost. It is therefore imperative that survey in situ is conducted with robust techniques to avoid jeopardising the investigation and any subsequent judicial proceedings.

Additional challenges are presented when investigating mass grave scenarios, in which remains may present in complex deposits with a high level of disarticulation, fragmentation and commingling. The current study explores the validation of digital techniques in order to obtain quality data that will meet the required standards of accuracy, validity and reliability needed to stand in a courtroom. In particular the research focuses on three-dimensional (3D) point cloud data generated through multi-view-stereo structure-from-motion (SfM-MVS) photogrammetry.

The aim is to define the applicability, limitations and accuracy of different parameters used to generate a single point cloud from a complex assemblage in order for such evidence to be accepted as an accurate record in legal contexts. Such digital recordings allow permanent storage of assemblages in 3D, facilitating the interpretation and presentation to both an expert and lay audience.

4 **AGRICULTURAL LIME AFFECTS NATURAL STRONTIUM ISOTOPE VARIATIONS—IMPLICATIONS FOR HUMAN MIGRATION STUDIES**

**Author(s):** Andreasen, Rasmus - Thomsen, Erik (Department of Geoscience, Aarhus University)

**Format:** Oral

The use of strontium (Sr) isotopes in prehistoric mobility studies requires accurate reference maps, which are often based on present-day surface waters. However, the use of modern agricultural lime in low- to noncalcareous soils can substantially change the strontium isotopic compositions of these waters. Waters unaffected by agriculture in western Denmark have an average  $^{87}\text{Sr}/^{86}\text{Sr}$  of 0.7124, whereas waters from nearby farmland have an average  $^{87}\text{Sr}/^{86}\text{Sr}$  of 0.7097. Moreover, a systematic investigation of a 1.5 km segment of a river originating in a forest—Karup Å, shows that  $^{87}\text{Sr}/^{86}\text{Sr}$  decrease abruptly from 0.7131 to 0.7099 upon entering lime-treated farmland. Calculations based on these data indicate that more than half of the Sr in the river’s catchment area comes from agricultural runoff. Of 30 ponds and lakes examined in areas with similar geology, 26 are located in areas unaffected by farming, 25 of these show Sr isotopic values in the range of 0.711-0.715. By contrast, the 4 ponds and lakes located near farmland all show lower Sr isotopic values, indicating that they are strongly affected by agricultural lime.

Thus, Sr-based mobility studies in areas with low- to noncalcareous soils should be reassessed; however, the data still hold valuable information. For example, reinterpreting the iconic Bronze Age women at Egtved and Skrydstrup, indicates that it is most plausible that these individuals originated close to their burial sites. Yet the results are interesting, in particular, The Egtved Girl’s, which show that she may have lived part of the year in one area—likely the local river valley, and part of the year in another place—likely the local plateau, perhaps in the practice of transhumance. The range of Sr isotopic values found in areas unaffected by modern farming suggests a much lower degree of individual mobility than previously thought.

5 **A HISTOTAPHONOMIC INVESTIGATION OF MEDIEVAL SKELETAL COLLECTIONS FROM TRONDHEIM, NORWAY**

**Author(s):** Hollund, Hege (University of Stavanger)

**Format:** Oral

Skeletal remains from medieval urban cultural layers are valuable historic archives that contain information on the make-up and life of urban communities, and on how they change and respond in relation to environmental, cultural and ecological changes through time. For example, questions regarding health status, diet and origins may be addressed by biomolecular and chemical analyses of skeletal elements. Application of analyses may be limited by the level of preservation of the material, and the work is complicated by diagenetic changes that may affect the analytical results. It is thus vital to assess post-mortem alterations of the remains and their current condition. To this aim, histological analysis was carried out on a set of skeletons from medieval Trondheim, part of a larger research project addressing urban health in the medieval (Medheal600). In this project, various strains of archaeological, historical and palaeocological evidence have been brought together. It includes osteological analyses, radiocarbon dating, stable isotope analyses and ancient DNA analyses of c. 100 human skeletons spanning a 600-year period, AD 1000-1600. The histological investigation of

a sub-set of these involved a qualitative characterisation of diagenetic alterations, using scanning electron microscopy as well as transmitted light microscopy. Such studies of taphonomy at microscopic level provide data and insights relevant for the reconstruction of taphonomic histories, by identifying diagenetic traits that reflect burial conditions and taphonomic processes. Furthermore, the histological investigation allows assessment of preservation. Correlation between the bone preservation parameters, and biomolecular preservation, may aid in understanding degradation processes that influence the materials’ information potential. Trondheim is Europe’s northernmost medieval town. The high latitude, relatively cool temperatures, and deep cultural layers has resulted in exceptional preservation of bone. Yet, diagenetic changes has occurred and these cause issues for biomolecular analyses. The presentation will summarise preliminary results and interpretation of the histotaphonomic work.

a. **DIET-RELATED TOOTH WEAR IN A HUMAN SKELETAL SAMPLE FROM MEDIEVAL CITY OF IAȘI (ROMANIA)**

**Author(s):** Petraru, Ozana-Maria (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology; Romanian Academy—Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Popovici, Mariana - Groza, Vasilica-Monica (Romanian Academy—Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Bejenaru, Luminița (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology, Romania; Romanian Academy—Iași Branch, “Olga Necrasov” Center of Anthropological Research)

**Format:** Poster

Dental macrowear is the nonpathological loss of the hard tissues on the occlusal surface of teeth. In bioarchaeological contexts, the tooth wear can be associated with lifestyles, habits, diet, food access preparation and techniques. Dental wear is strongly correlated with the physical properties of the consumed food being the result of a cumulative process that takes place over an individual’s life. The aim of this research is to assess the dental macrowear in a human skeletal sample of 17th century discovered discovered in the former capital city of Medieval Moldova, Iași city (Romania). The degree of dental wear was evaluated through ordinal methods (e.g. Scott’s method for recording occlusal molar wear), quantitative methods (computer-based image system), by recording the percentages of dentine exposure (PDE) and by scanning electron microscopy (SEM) technique. Procedures for stereomicroscopy and scanning electron microscopy were applied. The PDE recorded on the second molar teeth indicate that the macrowear is sex related affecting both male and female, but with a different intensity. The males are characterized by more dental tissue loss on the occlusal surface than the females; that distinction is probably mainly associated with the consumption of a differentiated diet more abrasive and erosive in males than in females. The micromorphological traits associated to dental tissue loss confirm the dental wear at a microscopic level and suggest the advanced macrowear.

b. **THE IDENTIFICATION OF KIN GROUPS IN EARLY MEDIEVAL WELSH CEMETERIES**

**Author(s):** Butler, Ciara (Cardiff University)

**Format:** Poster

This poster will present my PhD research on the evidence for kin-structured burial and social identities in the cemeteries of Early Medieval Wales. Multidisciplinary analyses, focused on dental methods, will investigate biological relationships within distinct groups of burials. Graves may be grouped through similarities in construction, provisions, location within the cemetery, or orientation. Such categorisations can indicate connections between individuals and may be seen as evidence for social relationships and shared identities. Clan or family groupings have often been suggested as a factor influencing differential burial practice in Wales in this period (White 1971; Britnell et al. 1990; Brassil et al. 1991; Jones 1992; White and Smith 1999), though this has never been investigated osteologically. This research utilises biological distance analysis of dental metric and non-metric data to examine genetic relationships within cemetery sites. Targeted isotope analysis using oxygen and strontium will then be carried out based on the results, to explore the origins of potentially unrelated individuals. The integration of these methods will enable the question of identities to be considered within a wider frame of mobility and migration. Such research has previously been hampered by the poor survival of human remains in Wales. However, in recent years the excavation of several well-preserved cemetery sites has significantly added to the corpus of Welsh osteological material. Some of these have yet to be published and the skeletal material has never been the subject of in-depth research and analysis. The use of dental morphological data, isotope analysis, and spatial analysis of cemeteries makes this an interdisciplinary project which will contribute greatly to our understanding of these communities in a period of upheaval and social change. The project is in its second year and I will present preliminary results with this poster.

c. **THANADOS - THE ANTHROPOLOGICAL AND ARCHAEOLOGICAL DATABASE OF SEPULTURES**

**Author(s):** Eichert, Stefan (Natural History Museum Vienna) - Brundke, Nina (Austrian Archaeological Institute)

**Format:** Poster

For the area of present day Austria burials are the main archaeological source for the Early Middle Ages ( ~ 600 - 1100 CE ) as in comparison there are hardly any settlements excavated. While only a handful of early medieval settlements are known there are several hundred cemeteries with thousands of graves that are published mostly in a very traditional way in form of printed books with catalogs, maps, figures and plates. Regarding archaeoethanatalogical questions they serve as the main source. Although nowadays many publications are open access, the underlying data (i.e. catalogs etc.) are not available as structured digital data that can be used further for digital analyses. Neither is it possible to get a glance at the big picture as mostly only single sites are processed. Cross site publications or homogenous data ranging over more than one site are hardly available.

Within the THANADOS Project (<https://thanados.net>) we developed open source web applications to collect data on burials and their context and to disseminate, query, analyse and visualise the data respecting the FAIR principles based on the CIDOC CRM standard of the International Council of Museums. The area of present day Austria served as a case study and the data pool consists of appr. 500 burial sites with altogether roughly 5000 graves and several thousand finds that are provided as open data under open licences.

The proposed poster wants to present this project and show how it can serve as a hub for cross disciplinary Archaeothanatology related data.

d. **TAPHONOMIC STRUCTURAL CHANGES OF ARCHAEOLOGICAL HUMAN HAIRS DISCOVERED IN IAȘI (ROMANIA): A MICROSCOPIC ASSESSMENT**

**Author(s):** Petraru, Ozana-Maria (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology; Romanian Academy—Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Groza, Vasilica-Monica (Romanian Academy—Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Neagu, Anca-Narcisa (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology) - Bejenaru, Luminița (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology; Romanian Academy—Iași Branch, “Olga Necrasov” Center of Anthropological Research)

**Format:** Poster

During the archaeological excavation at “Adormirea Maicii Domnului” Roman Catholic cathedral of Iași (Romania), 13 human skeletons of 18th–19th-century were discovered. In the case of four skeletons, textile fragments and several strands of scalp hair were also found in a good state of preservation. Archaeological human hair can offer valuable information to both bioarchaeology and forensic science through a taphonomic approach. Although the taphonomic process has been intensely studied on the skeletal human remains, the micro-taphonomy of the archaeological non-skeletal human remains is not yet studied at the same scale. The aim of this study is to assess the taphonomic changes through microscopic analysis of the human hairs discovered in the mentioned archaeological site. The alteration of hair shafts was evaluated using optical microscopy (bright field, differential interference contrast, epifluorescence), scanning electron microscopy (SEM), cross-section image analysis by Image J software, and hair histological scores. Age estimation at death and sex evaluation, scanning electronic microscopy, histological cross-sections by cryotomy and HE stain were applied. Results of our research indicate that the hair external alterations produced by the micro-organisms activity are statistically significant. Image analysis results of the internal degradation of hairs were correlated to external lesions. We presume that the variation in hair degradation is more likely caused by the synergic action of intrinsic biological factors, but environmental conditions can be also involved (e.g., burial season, specific conditions of the grave).

507 **GENERAL SESSION - LIMES, BORDERS, MARGINAL ZONES**

**Theme:** 2. From Limes to regions: the archaeology of borders, connections and roads

**Chair:** Herold, Hajnalka (University of Exeter)

**Format:** Regular session

**ABSTRACTS**

1 **TELL ME A STORY... INTERROGATING THE OBJECT – REFLECTIONS ON THE IRON AGE CERAMIC VESSELS OF THE NORTHERN IBERIAN PENINSULA**

**Author(s):** Pinto, Dulcineia (EPA)

**Format:** Oral

This communication aims to synthesize some questions related to the ceramic containers from the Northern Iron Age of the Iberian Peninsula, with regard to the shape and decoration of ceramic containers.

The analysis will focus on qualitative rather than quantitative data because, in a high number of cases, the published data on the different sites only allow this type of assessment.

The ceramic sets belong to several “cultural groups” and integrate an enormous formal diversity that is subdivided, roughly, into simple and composite - “S” profile. All shapes can be decorated. However, non-decorated containers are an important presence in some communities.

Regarding the shapes, we will analyze the existence of an association between shape and decoration, also looking for a possible relevance of the “S” profile containers in relation to other shapes.

We will also analyze the decorative styles, divided into two: (i) those that use the container as a canvas, where a scene unfolds (a scene of everyday life, for example); (ii) and those that seem to incorporate the container in very formalized compositional schemes, essentially geometric.

The important questions to discuss will be: (i) when, how and where does the container become a “canvas”; (ii) if the geometric decoration can be understood as a “scene” and (iii) if it is possible to understand the container as a body-container materializing an anthropomorphic conceptualization of it.

Finally, it will be discussed whether in terms of social valorization, which is at the same time aesthetic, in certain containers the decoration would simply be “unnecessary”, while in others it would be an integral part of the container. In fact, the decorative differences in containers suggest structural differences in terms of aesthetic behavior that, in their different contexts, bring communities together in some cases, and keep communities from each other in other cases.

2 **CULTURAL BOUNDARIES IN THE LOWER SOUTHWEST IBERIAN CHALCOLITHIC THROUGH THE CRESCENT-SHAPED LOOMS OF SÃO BRÁS (SERPA, PORTUGAL)**

**Author(s):** Agosto, Frederico (School of Arts and Humanities of the University of Lisbon)

**Format:** Oral

Is there a cultural specificity within the larger context of the Southwestern Iberian Chalcolithic? Could a specific cultural boundary in the lower southwest be argued from a different weaving assemblage (understood as a consistent “intense network”, as by Deleuze envisioned)?

Through the habitus, and the cultural tradition implied in the production of distinct crescent-shaped looms, for, and as defended by Mauss, the existence of an underlying tradition is needed for the support of the techniques themselves and the transmission of ideas, the question of a different milieu, implying different territories and, for that reason, the carving of a separate carte (all of these used in their Deleuzian meanings), can be brought into the debate.

The Cerro dos Castelo de São Brás (Serpa) is a walled enclosure excavated in the end of 70s by Rui Parreira, when the Chalcolithic south of Tagus was still a poorly known reality, being one of the first, when it comes to this settlement type, to be interventioned with scientific rigour and method. Through the study of the morphology, the metric data and the contextual information of the crescent-shaped looms of the Cerro dos Castelos de São Brás (Serpa), all important aspects in the differentiation of a distinct habitus and a different milieu for such an important cultural practice, and, thus, a prime medium for cultural negotiation in general, a proper approach to the question can be attempted.

Aided by previous published synthesis and works concerning the southwest weaving practices, the existence of a differentiated cultural identity in the Baixo-Alentejo and Algarve regions of the lower southwest 3rd millennium BCE will be debated.

3 **TERRACOTTA LAMPS FROM THE ROMAN FORT IN APSAROS. EVIDENCE OF PAN-PONTIC MARKET OR MILITARY SUPPLY SYSTEM?**

**Author(s):** Jaworska, Maria (University of Warsaw)

**Format:** Oral

Excavations carried out over the past several years in the Roman fort in Apsaros (modern Gonio, Georgia) have provided a number of crucial discoveries on the functioning of the fort, as well as its place in the network of fortifications that formed the Pontic Limes. Results of the research led to conclusions concerning not only the chronology of the fort but also its historical and economic landscape.

Archaeological finds, obtained by the Polish-Georgian archaeological mission in the years 2014–2019, have been analysed to answer questions regarding imports and local production that constituted the fort’s supply system. In these studies, terracotta lamps deserve special attention. The repertoire of forms discovered in Apsaros is intriguing in itself. In addition to very popular forms, it also represents types which are extremely rare. Based on the morphological groups of lamps, some tendencies in the influx of these peculiar finds can be distinguished.

The main question of the paper concerns similarities between lychnological material from Apsaros and other sites located along the Black Sea coast, and whether the presence of the Roman army had any influence on the repertoire of lamp types found on the site. Another task of the present paper is to include Apsaros in the pan-Pontic maritime networks and establish their connections with military supply system in the region.

4 **HOW DID THE ROMAN FORT IN APSAROS FALL? NUMISMATIC EVIDENCE FOR THE BORANOI SEABORNE INCURSION IN COLCHIS**

**Author(s):** Jaworski, Piotr (Institute of Archaeology, University of Warsaw)

**Format:** Oral

The fundamental source concerning the course of the seaborne invasion of Boranoi against the coast of Colchis, which took place in AD 250s, is the Historia Nova written by Zosimos. Although this Constantinopolitan historian, operating at the turn of the 5th and 6th centuries, does not directly mention the barbarian attack undertaken on the Roman fort at Apsaros, nevertheless, according to his words, one can assume, that the route of the fleet, which the Boranoi used to travel towards Trapezus, led along the eastern coast of Colchis and they should, therefore, have travelled nearby this fort.

Archaeologists researching the ancient Apsaros have from some time considered the Boranoi incursion as one of the possible reasons for the Roman army abandonment of the fort and its destruction dated to around the mid-3rd century. This hypothesis seems to be confirmed by the numismatic evidence obtained in recent years from the fort in Apsaros: both individual coins found in the burnt layers attesting the fire, as well as hoards found around.



5 THE SEEDS OF AUTHORITY: AN ARCHAEOBOTANICAL STUDY OF GRAKLIANI HILL, GEORGIA

**Author(s):** Turchin, Katherine (University of Oxford Institute of Archaeology; University College London)

**Format:** Oral

Grakliani Hill is a Bronze-Iron Age settlement in eastern Georgia that served as a regional cultic centre in the 1st millennium BC. From 6-4th centuries BC, eastern Georgia came under control of the Persian Empire. Grakliani’s connections with Persia are well attested artefactually through imported ceramics. However, the extent to which Persian influence actually manifested in day-to-day life at Grakliani is unclear. Was the settlement directly overseen and influenced by Persians, or was it independently administered by local elites? This can be explored through archaeobotany, which provides insights into the site’s sociopolitical organisation by revealing its agricultural system.

This pilot study presents the first archaeobotanical results from Grakliani, and uses them to preliminarily assess the extent of Persian influence on Grakliani’s sociopolitical organisation. Persian imperial ideology was strongly based around food and feasting; the presence of Perisan authority in peripheral settlements may thus be indicated through intensification of agriculture, more centralized crop storage, or introduction of new crops. The analysis of 11 samples, distributed between the pre-Persian and end of the Persian occupation phases, shows that the agricultural system remained the same across both periods, with barley and millet as staple crops. In other areas of the Persian frontier, imperial power was physically manifested through elite buildings or changes in agriculture. In contrast, Grakliani lacks this, and seemingly operated without direct Persian presence. It was already a regional centre with an intensified agricultural system when it came into contact with the Persian Empire. Local elites maintained control of the subsistence system in which bread production and grain storage were associated with local cult structures. They likely paid tribute to Persia, and received prestige goods in return, but were overall autonomous. This contributes to our understanding of eastern Georgia as more sociopolitically complex and independent from Persia than previously thought.

6 TYPOLOGICAL SPECIFICS OF THE ARCHITECTURE OF EARLY CHRISTIAN CHURCHES IN THE INNER DALMATIA

**Author(s):** Voronova, Ariadna (St Tikhon Orthodox university)

**Format:** Oral

The early Christian architecture of the interior of the province of Dalmatia developed in the context of geographical isolation from the sea and its coastal centers, herewith the mountainous landscape of these lands hampered the penetration of foreign influences, as well as the conservatism of the local romanized population. Most of the settlements in the region lived by mining iron ore and agriculture, as evidenced by the simplicity of the interior and construction of churches. In most cases, the village churches arose on the Roman roads connecting the littoral with the hinterland and close to the fortified objects. The destruction and rebuilding of the majority of monuments occurred at the beginning of the V century with the establishment in the region of the power of the Ostrogoths, when samples for the local churches served the basilicas at the major centers of Dalmatian seaboard – Narona and especially the provincial capital Salona. Later the typology of local early Christian churches, with some exceptions, demonstrates a relative stability, which is expressed in a combination of a small space for praying and a large number of auxiliary rooms, including baptistery. A rarity in the architectural typology of the region are one three-aisled basilica, two triconchal churches, several double churches, as well as the presence in some churches the triumphal arch and the transept. Of interest is the architectural plastic, the fragments of which are made reconstruction of altar barriers in three churches, and a unique phenomenon are the ancient German runes (Futhark), carved on one of the columns of the triumphal arch in the church of Breza.

7 CONCEIVING CHANGES: A CASE STUDY (SAN GIORGIO IN BASAGLIAPENTA-UD-ITALY)

**Author(s):** Cividini, Tiziana (Indipendent Researcher) - Sarcinelli, Irene (University of Primorska)

**Format:** Oral

The six excavation campaigns carried out at the San Giorgio Martire site in Basagliapenta (Basiliano, Udine, Italy) - preceded by geo-archaeological investigations - allowed to retrace evidence of the persistent occupation and the substantial functional transformations this rural settlement located in the central Friulian plain experienced over the centuries. Although the archaeological surveys have not yet been completed, it is already possible to outline the main phases for the site. Subsequent to an occupation ascribable to the late Augustan period - solely attested by abundant pottery findings and coins - a lime kiln was built on the site, probably in the Late Antiquity or the Early Middle Ages. The data relating to the existence of a melting furnace are still scarce, yet consistent evidence is provided by the significant quantity of ferrous slags and deep pits with half-baked walls and ash-covered bottom. Considering the stratigraphic sequence, it is likely that the furnace preceded the site’s transformation from productive district to religious area. Following the dismantlement of the lime kiln, some inhumations dated from at least the 9th century (C-14 dating) were positioned above it. The burials’ arrangement leads to suppose the existence in this period of a first oriented religious building, whose structure was gradually enlarged and equipped with apses of different shapes and sizes. Meaningful is the presence of almost ten inhumations of newborns and fetuses along the external perimeter of the medieval church (12th-13th century) and adults’ burials pertaining to a later phase. To be further investigated is the role of Lombard and Slavic groups, already attested in the Friulian plain. This paper aims to outline the archaeological evidences documenting the transformation of the site’s settlement layout from the Late Antiquity on, focusing on the planimetric articulation of productive and religious structures and to selected materials’ assemblages.

8 BORDERS? - WHICH BORDERS?

**Author(s):** Schwenzer, Gerit (no affiliation)

**Format:** Oral

The modern day border triangle of Austria, Hungary and Slovakia divides an area so rich in archaeology, history and culture which once was so tightly connected. At the far western area of the Carpathian basin a lot of cultural movement happened at the end of the late Iron Age and the beginning of Romanization. In the rough time frame of 150 years four different cultural groups moved in these parts, connected and seperated again in the one way or the other. Networks of trade were created which survived into Roman times and were adapted. Borders were more flexibly interpreted than at present day.

This paper shall shed some light on the interactions of these cultures at the end of the late Iron Age and the brink of Romanization. A selection of important sites and some key points of the networks as well as the mutual impact of the peoples in this region shall be presented and discussed.

508 GENERAL SESSION - NEOLITHIC WORLD

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Chair:** Müller, Johannes (Kiel University)

**Format:** Regular session

ABSTRACTS

1 THE RELIGIOUS SYMBOLS IN THE NEOLITHIC PERIOD AND THE EFFECT ON THE PRESENTATION OF ANATOLIAN CULTURE

**Author(s):** Sozer Kolemenoglu, Selma (Universidad Empresarial -Costa Rica; Unem Student Community)

**Format:** Oral

It is possible to define the religious symbols in the psychology of human science - which is the starting point of the Anatolian continent religious symbols in the Neolithic period culture history and the religion - and in the existence structure of the ontological and philosophical anthropology involved in the religion philosophy. The most outstanding symbol of the neolithic period is the mythological rituals of the mother goddess figurines. The figurines and animal representations, scientific reading of the seal and language narratives are hided in a “secret” together with the unity of selves and religious symbol in the structure of human by continuing cooperation of the selves in the system beyond time, which is intangible in human structure. Man in Diversity, Ethics, Cosmopolitanism, Identity, Post-Colonialism, Art, Religion, Archaeology, Antropology, has also left the symolic messages of tangible wares which he left as evidence. It is seen that since the beginning, the methodical searching has been sending the same message systematically. The cosmic refractions remind the age when the Prophet Ibrahim, lived in Urfa, in Anatolia between the dates of 3200-1800 B.C. defends the religion of oneness and his hanging the axe symbol to the neck of great icon by not permitting the demons in the archetypal metaphors. Human Science, History of Religion, the theological knowledge, the horizontal and vertical effect of the assessment and evaluation of the religion define a vision of world where the human figures are living together with their semblances. And the climate changes are seen as an important cosmic indicator of this. Also, human images of Mother Goddess figurines, which are active symbolic value expression in Anatolia, give the warning that the human which wanted to be taken as an example needs to exceed his development and human’s dual ambivalence.

2 PLANT EXPLOITATION IN THE EASTERN PROVINCE OF THE LINEAR POTTERY CULTURE

**Author(s):** Moskal-del Hoyo, Magdalena - Kapcia, Magda (W. Szafer Institute of Botany, Polish Academy of Sciences)

**Format:** Oral

Little is known about the plants used by the first farmers of the eastern-most province of the Linear Pottery culture. New archaeological excavations at two settlements from this region may help to fill this gap as they have provided archaeobotanical samples: 1) Nicolaevca, Singerei district, Moldova and 2) Kamyane, Savrans'sky district, Ukraine. The settlements are dated to the transition from the VIth millennium BC to the Vth millennium BC. The analysis of charred plant remains, including fruits, seeds, and wood charcoal fragments, have shed light on the food supply as well as provided information about local forests. Remains of cereals (mostly emmer wheat *Triticum diccocon*) may confirm that cultivated plants were consumed, while the remnants of wild herbaceous plants may suggest that agricultural practices took place locally and were integrated parts of the first Neolithic package. Both sites are located on the areas covered by chernozems and in the forest steppe zone. The analysis of charred plant assemblages may indicate that in the Atlantic period, in the areas near the settlements, a forest-steppe developed with oaks (*Quercus* sp.) as the dominant trees. Among herbaceous plants, the presence of xerothermic Feather grass (*Stipa* sp.) was also documented, which is a typical plant of steppic vegetation.

3

HOUSES AS WORKSHOPS: NEOLITHIC BUILDINGS OF VRBJANSKA ČUKA IN PELAGONIA

**Author(s):** Naumov, Goce (Center for Prehistoric Research)

**Format:** Oral

Vrbjanska Čuka is multi-layer site in the Northern part of Pelagonia, an elongated valley with a high density of tells located near marshy wetlands. This tell was established in the Early Neolithic and after 300 years of occupation was abandoned until the Late Classical period, when it was used as a villa rustica. The Neolithic horizons indicate an intensive and dynamic building process, shown in a number of layers with building and frequent re-building phases. Our current research detects at least 11 buildings in three architectural horizons, demonstrating a high level of renewing and foundation of new buildings one above another in the central part of the settlement.

Building 2 is of particular interest due to its large size (approximately 130m2) and a large number of clay installations, including 12 structures such as ovens, bins, granaries, platforms etc. After the final occupation of Building 2, its inventory was removed except for more than 30 grinding stones, that were turned upside down in order to perform a symbolic action of closure. Due to the large number of clay installations, this building was most likely used as a workshop for cereal storage and processing, as well as for bread production. A comparison of the function of Building 2 will be made with other proximate buildings. Its role in social agency and symbolism will be highlighted, as well as the embedding of the concept of anthropomorphism within the birth, life and death of the buildings. This notion is also manifested through anthropomorphic house models, found in Vrbjanska Čuka and elsewhere in Pelagonia.

4

NEOLITHIC ENCLOSURES IN THE CENTRAL-WESTERN PART OF FRANCE : THE EXAMPLE OF THOUARS/ LOUDUN TERRITORY (DEUX-SÈVRES/VIENNE)

**Author(s):** Legrand, Victor (Université Toulouse II - Jean Jaurès; UMR 5608 - TRACES) - Bruniaux, Guillaume - Mathé, Vivien (Université de La Rochelle; UMR 7266 - LIENSs) - Ard, Vincent (UMR 5608 - TRACES)

**Format:** Oral

Within the framework of the ANR “Monumen”, a Master’s degree, then a thesis work in progress, the Central-Western region and its Neolithic enclosures are being studied from a new angle, in particular thanks to the geophysical prospecting set up since 2010. The largest corpus of enclosed sites in Western Europe, although excavated since 1882, has never yet been the subject of a typological synthesis, as has been done for funerary monuments.

The aim of such a synthesis will be to characterize these grave enclosures, in terms of topographical layout and morphology. For this purpose, non-invasive methods are used, such as aerial and geophysical surveys and spatial analyses. Focusing on a geographical area that is as representative as possible, this paper will present the enclosures and their perceived diversity thanks to non-invasive methods, as well as their relationship with, for example, dolmens. The micro-territory of Thouarsais/Loudunais is a good study laboratory as it gathers:

- Two megalithic necropolises with imposing monuments (Taizé and Chantebrault) and the dolmens of Puyraveau, which have yielded abundant funerary material from the late Neolithic period (Ard, 2011),
- Seven Neolithic enclosures, all prospected in geophysics and one excavated recently.

It is a synthesis of the different results obtained on this micro-territory that will be presented here. Indeed, following the geophysical prospecting carried out on this territory, the layout of the enclosures has been considerably refined, especially the entrance systems. On the other hand, the visibility analyses, linked to the location of the sites, showed a partition of the territory. Through this presentation, we will therefore see the contributions and limitations of such approaches.

5

EARLY AGRICULTURE IN THE BANAT THE SITE OF MOVILA LUI DECIOV, JUD. TIMIȘ, IN WEST ROMANIA

**Author(s):** Krauss, Raiko (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters) - Ciobotaru, Dan (Muzeul Banatului Timisoara)

**Format:** Oral

Since 2018, the archaeological excavations at the well-known early Neolithic settlement of Movila lui Deciova have been resumed by an international team from the University of Tübingen and the Museum of the Banat in Timișoara. The multi-layered site offers an insight into the economy and living conditions of the earliest farmers in the eastern part of the Carpathian Basin. The economy in this area is characterized by numerous rivers and shows elements of the Balkan Neolithic as well as local Mesolithic traditions. How is this area of tension to be assessed? Is this to be regarded as a specific feature of the region? Did the Neolithization happen, as elsewhere, through the immigration of a new population, or was it only due to a cultural impulse from outside? We want to report on the ongoing excavations to contribute to the discussion of these questions. The chronology and material culture of this site will be presented as well as the first results of the archaeobiological investigations.

6

THE NEOLITHIC LANDSCAPE: A SCENE FOR THE CULTURAL DIVERSITY OF NORTHEAST HUNGARY BETWEEN 6000-4500 BC

**Author(s):** Füzesi, András (Eötvös Loránd University)

**Format:** Oral

The cultural diversity of the Carpathian Basin is clearly demonstrated by changes of ceramic decorations. Ferenc Tompa and Gordon Childe already paid close attention to this phenomenon in their definitive monographs (1929). This cultural diversity coupled with a very mosaic environment of the Carpathian basin, which correspondence suggested a kind of causality between these conditions. The analytical archaeology with its distinct methods was able to demonstrate such correlations, mapping cultural groups and environmental regions with definite boundaries. The new concept of landscape theory in connection with system and entanglement theory, taskscape and network analysis offers a wider and more complex framework of the interpretation. Among the different (ecological, cultural, economic and symbolic) aspects of the landscape, a host of connections exists, sprouted from the societies that created those landscape phenomena.

In such a wide region like Northeast-Hungary many microregions coexisted in every archaeological period with different ecological backgrounds and social-cultural traditions. Polgár Island is a prominent micro-region in this area, which has been investigated by the ELTE Institute of Archaeological Sciences since 1989. Its cultural diversity throughout the Neolithic reflects a special strategic position. Many other microregions, like Füzesabony, Rétköz, Bodrogekő, existed in the Neolithic period and had diverse cultural identity. Creation of these identities were running parallelly to and through the creation of the local landscapes. Connections between landscape and culture are multivariate and based on their concepts: Landscape created by humans within the environmental framework and Culture created also by humans because of the environmental restrictions.

7

USE OF PLANTS DURING THE LINEAR POTTERY CULTURE: NEW ARCHAEOBOTANICAL STUDIES FROM THE SOUTHERN AREAS OF POLAND

**Author(s):** Moskal-del Hoyo, Magdalena (W. Szafer Institute of Botany, Polish Academy of Sciences) - Lityńska-Zajac, Maria (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Kapcia, Magda - Korczyńska, Marta (W. Szafer Institute of Botany, Polish Academy of Sciences) - Kenig, Robert (W. Szafer Institute of Botany, Polish Academy of Sciences; Institute of Archaeology, Jagiellonian University) - Nowak, Maciej (Pracownia Archeologiczna Maciej Nowak) - Szeliga, Marcin (Institute of Archaeology, Maria Curie-Skłodowska University)

**Format:** Oral

A new type of economy based on food production began in the middle of the sixth millennium BC in Poland with the appearance of the Linear Pottery Culture of Danubian origins. Southern Poland belonged to one of the earliest regions occupied by the Neolithic groups and constituted one of the eastern-most areas of the Linear Pottery complex. Plant cultivation was a key element of the “Neolithic Revolution” and one of the most important innovations. The analysis of charred plant remains found at archaeological sites helps to better understand the spread of agriculture in the present-day territory of Poland, which in turn is important for a study of Neolithization processes in Europe. The present study is focused on new archaeobotanical assemblages gathered at newly excavated sites from southern Poland (Modlniczka site 4, Spytkowice site 26, Tominy site 6 and Jastków sites 1 and 46). The results were compared with other Polish and European archaeobotanical and palaeoenvironmental data and aimed at describing the food economy of the first farming groups that settled in south-eastern Poland and at characterizing the local environmental conditions of the sites, which are located in loessic regions or on the borderline of the loessic and the sandy-clay areas.

8

RECONSTRUCTING LBK HOUSES WITH TRAPEZOIDAL FLOOR PLANS WITH THE DATA OF SIMILAR HOUSES

**Author(s):** Minnich, Alexander (Universität Wien)

**Format:** Oral

Site 3 of the Linear Pottery Culture (LPC) settlement of Brunn am Gebirge, Flur Wolfholz has seven houses with a rectangular floor plan, as well as a further five houses with a trapezoidal floor plan. One of these houses, house 38, has been preserved so well that it is possible to draw conclusions about various construction phases, the internal measurement system, the basic structure and the useful life of the house. A comparison with the LPC house 16 from Schwanfeld, Germany, shows clear similarities between the two houses in terms of post spacing and their internal structure. The data from both houses enabled a three-dimensional reconstruction of House 38 from Brunn am Gebirge, which raises further questions about house construction. Since the width of the house increases by 1.50 meters from north to south, the question arises whether the gable of the house rose towards the south. Here, the house orientation plays an important role, since the lighting effect in the interior would have been optimally used with a gable raised in the south. Furthermore, potential side entrances will be dealt with, which until now have only been interpreted indirectly via interrupted lateral house pits. In addition, the interior layout will be discussed in the reconstruction of the house. Since the house has up to three different construction phases, the question arises as to in what period of time a Linear Pottery Culture house was built and whether a slow, gradual expansion of the house can be assumed over the years. The different design of the different parts could be a first indication.

a. **BURNT, STILL ALIVE: PREHISTORIC FIRED HOUSES IN NORTHERN GREECE AND THEIR SIGNIFICANCE IN THE ARCHAEOLOGICAL RECORD**

**Author(s):** Kaltsogianni, Styliani (Aristotle University of Thessaloniki)

**Format:** Poster

The study of the way people appropriated space during Prehistory leads admittedly to information about their way of living; the study of the use of prehistoric spaces, therefore, attracts a great part of archaeologists' interest, as it is supposed to contribute to the apprehension of life during Prehistory. Reports on the use of space in various excavated neolithic and bronze age dwellings tend to be the rule regarding prehistoric architecture in Southeastern Europe and Near East, but building technology, in contrast, that equally serves the apprehension of prehistoric societies thanks to its reciprocal relation to social structure, proves to be less attractive to researchers. The 'humble' and of seemingly low status constructions tend to lack archaeologists' attention, despite the fact that they incorporate the fundamental principles of the applied building technology, which relate, in turn, to the basic prehistoric structural materials – wood, stone and clay – and their properties, as well as to the acquisition, treatment, assembly and fitting of the materials mentioned above together. The present poster gathers the main results published so far regarding neolithic building technology in Northern Greece. It is underlined that the study of structural clay fragments, that mainly come from buildings and settlements obviously destroyed by fire, can help us face each architectural assemblage as a unique case instead of formulating any generalizing views on prehistoric architecture and outline in more exact terms the identity of the prehistoric built environment and consequently of the surrounding landscape and the actions taking place in it, as far as this study enables the comprehension of dwellings, starting from the kind and the quantity of the exploited sources and moving forward to the processes to which they were submitted and yet to the precise identification of parts of the house, that can altogether reveal its figure.

b. **TEXTILE PRODUCTION IN CENTRAL EUROPE DURING NEOLITHIC AND AENEOLITHIC PERIOD AND ITS GRADUAL TRANSFORMATION**

**Author(s):** Šofránková, Jana (Faculty of Arts, Charles University)

**Format:** Poster

The poster deals with textile production and its gradual transformation during the Neolithic and Aeneolithic periods. Territorially, it covers the region of Moravia and southwestern Slovakia. The study is done by closer attention paid to the tools traditionally connected with textile production – spindle whorls and loom weights. Such tools were collected in a database and the gained data are presented here in graphs. The quantity of them, their types and weight, can tell us a lot about the past practices in textile production. There are only a few spindle whorls recovered from the Neolithic period in comparison to those of Aeneolithic period, but differences can be still outlined. While throughout the Neolithic period the types of spindle whorls are more conservative, during the Eneolithic period we observe many new types of spindle whorls, with a surprisingly balanced ratio. This trend can be observed all throughout the region, but especially on sites located high within the landscape.

Principally, two aspects will be considered in the poster – a chronological and a territorial one. The analysis of the various aspects of the transformation in textile production and the related social change between the Neolithic and Aeneolithic period is based on actual objects handled by me. Based on literature, this will be compared with the territory of the present-day Hungary. Through a comparison of spindle whorls from these two areas, I would like to clarify whether there are similarities, how types and distribution of the spindle whorls spread from one area to another, and to describe main principles of textile production and its transformation and transmission according to regions in the Carpathian Basin.

**509 GENERAL SESSION - EURASIAN NOMADS**

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Chair:** to be confirmed

**Format:** Regular session

**ABSTRACTS**

1 **TUNNUG 1 AND THE EARLY NOMADS - NEW EVIDENCE FOR CULTURE CONTACTS AND MIGRATION BETWEEN SOUTH SIBERIA AND CENTRAL ASIA**

**Author(s):** Caspari, Gino (Sydney University; University of Bern)

**Format:** Oral

In three campaigns from 2018-2020 the early "Scythian" burial mound Tunnug 1 in Tuva Republic has started to unveil the cultural connections between the earliest horse-based economies and sedentary agricultural societies to the south. Well-preserved wood architecture similar to Arzhan 1 was found under the kurgan dating into the 9th century BCE. Documenting the Early Iron Age monument has not only resulted in insights into this period, but led to the discovery of a plethora of items from the Bronze Age to the Turkic period showing the diachronic development of these connections. We present new findings and the far-reaching cultural connections which can be inferred from them. Based on a stylistic analysis we show connections to Central Asia. Radiocarbon dating,

stable isotope analyses and ancient DNA investigations of the human remains will provide information about the complex history of migration, painting a detailed picture of South Siberia's connections to neighboring regions of the Eurasian steppe belt and the spread of Scythian material culture.

2 **PARTS OF MONTEFORTINO HELMETS IN THE SANCTUARY GURZUFSKOE SEDLO: THE PARALLELS TO SARMATIAN 'RITUAL HOARDS' IN THE NORTH PONTIC REGION**

**Author(s):** Novichenkova, Maria (Institute of Archaeology of National Academy of Sciences of Ukraine)

**Format:** Oral

The interconnections of the discovery of the details of the Montefortino helmets, one of the categories of chronological groups of Roman Republican equipment from the barbarian sanctuary near the pass Gurzufskoe Sedlo in Mountain Taurica, and the finds of Montefortino helmets from the other archaeological sites of the North Pontic region as markers of military-political contacts at the turn of the second – the first centuries BC are investigated.

The Roman Republican armour from the other archaeological sites of the North Pontic region is presented entirely by the Montefortino helmets finds. The significant part of the considered finds in the area were found in the so-called 'ritual hoards' of military items of the second-first centuries BC associated with cult rites of an early Sarmatians. The appearance of Montefortino helmets in the North Pontic region is associated with the participation of the barbarous tribes in the events of the Mithridates Wars.

3 **VETTERSSELDE-WITASZKOWO HOARD AND DECONSTRUCTION OF ITS ENSEMBLE**

**Author(s):** Topal, Denis (University of High Anthropological School; National Museum of History of Moldova)

**Format:** Oral

In 1882, in the north of Lower Silesia, near the Vetersfelde village (modern Witaszkowo, Poland) was found and soon published the famous jewellery assemblage. This set of things, which is stored now in Berlin, still remains the most western find of items of Scythian origin. Judging by the subjects and scenes presented on the fish-shaped mount, a clover leaf-shaped phalera and a sword sheath, all these objects represent an integral ensemble. Most researchers accept the date "turn of the 6th–5th centuries BC" noticing that the sword occupies the oldest part of the chronological interval. At least three objects from the treasure are executed in the animal style: the "fish" mount, the sword sheath and a "clover-shaped" phalera. The specific of the images on the fish-shaped plaque indicates a clear Greek Ionian production. However, regardless of the place of production and cultural affiliation of the executor of this set, these items are subordinate to the visual language adopted in a nomadic milieu using the images common for Ionian manufactures. Among the main expressive means are pairing, symmetry, repetition and antithesis.

a. **ELITE OF NOMADIC PASTORALISTS OF THE SOUTHERN URALS IN THE 4TH CENTURY BC: THE NATURE AND DIRECTIONS OF RELATIONS**

**Author(s):** Myshkin, Vladimir - Khokhlov, Aleksandr (Samara State University of Social Sciences and Education) - Kitov, Egor (Institute of Ethnology and Anthropology of the Russian Academy of Sciences)

**Format:** Poster

Funeral monuments of the 4th century BC and in particular, the mounds, the construction of which requires the attraction of considerable material resources and physical efforts of a large number of people for a long time, record the existence of a large association or several associations of nomads in the steppes of the Southern Urals with a complex hierarchical social structure. The Kurgan burial ground Filippovka I, located between the rivers Ural and Ilek, is one of the necropolises of the social elite of nomads. It consisted of 30 mounds. All of them were investigated (excavations by A.Kh. Pshenichnyuk and L.T. Yablonsky), and the results of the excavations were published. The archaeological materials obtained demonstrate the relations with the nomadic population of Altai, the Don region, the Scythians of the Northern Black Sea region, the population of the North Caucasus, and Achaemenid Iran. The manifestations of the ties that could arise as a result of trade or exchange, political interaction (receiving gifts, military booty), inclusion of foreign cultural groups are considered. The study of craniological materials made it possible to establish a certain homogeneity of representatives of the social elite buried in the mounds of the Filippovka I burial ground, their degree of similarity with the ordinary population of the Southern Urals of this and previous times, as well as with the populations inhabiting neighboring regions in the 7th-4th centuries BC.

This work was supported by the Russian Science Foundation, project No. 18-18-00137.

b. **THE KURGAN BURIAL GROUND SAMORODOVO, THE NEW MONUMENT OF THE EARLY IRON AGE NOMADS OF THE SOUTHERN URALS**

**Author(s):** Evgenyev, Andrey - Kuptsova, Lidia - Kuptsov, Evgeniy - Kryukova, Elena - Kharlamov, Pavel (Orenburg State Pedagogical University)

**Format:** Poster

In 2018 the kurgan burial ground Samorodovo, consisting of 3 kurgans, was investigated. 17 burials were identified (including 1 collective with the remains of 10 people), as well as sacrificial complexes of the early Iron Age. All necropolis mounds were made at the end of the VI - beginning of the V century BC and used by nomads of the region as a burial place for about 100 years.



One of the features of the mound construction is the formation of the kurgan 1 from the folded sod blocks. The funeral rite is different, but is represented mainly by the inhumation. The main burials of all three kurgans were made at the level of the ancient horizon and are covered by floorings of logs. The collective burial 3 from kurgan 1 is accompanied by a ritual burial of a horse. The rite of full and partial cremation was made in three burials of the kurgan 3.

In the course of the research, important data were obtained on the funeral rites of nomads, as well as a collection of more than 500 items of local and foreign production, including samples of various weapons, jewelry, metal and ceramic ware. In a number of cases, the finds have no analogues in the synchronous monuments of the Sauromatian-Sarmatian culture.

The typological analysis of the findings, as well as data obtained by experts in the natural sciences (anthropology, paleozoology), suggest the existence of economic ties between the nomadic population of the region and the Aral Sea region, as well as the territories that were part of the Achaemenid Empire.

The work was supported by the RFBR grant No. 40031.

## 510 GENERAL SESSION - ARCHAEOLOGY OF THE CARPATHIAN BASIN

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Chair:** Rácz, Zsófia (ELTE – Eötvös Loránd University, Institute of Archaeological Sciences, Budapest)

**Format:** Regular session

## ABSTRACTS

### 1 FROM THE HUNNIC TO THE GEPIDIC PERIOD? THE CASES OF THE CEMETERIES OF ÁRTÁND

**Author(s):** Kiss, Attila (MKI; PPKE Archaeological Institute)

**Format:** Oral

The cemeteries around Ártánd (Hungary, Hajdú-Bihar county) has long been known in archeological research of early migration period. Unfortunately, only two of the four known archaeological sites (Ártánd-Lencsésdomb, Biharkeresztes-Toldi útfél) have been fully published. The evidence and system of customs found in 5th-century cemeteries of Ártánd Kis-and Nagyfarkasdomb earlier interpreted as unambiguously Gepidic all suggest the material culture of the 5th century. These cemeteries were opened directly before or under the Hun period and those near Ártánd had been used until the last third of the 5th century by the local population (Nagyfarkasdomb and Lencsésdomb). Though the earliest burial can be dated back to the mid-and second half of the 5th century, yet the material of the earliest grave may occupy the same time horizon as the earliest row-grave cemeteries of Transylvania and the Great Hungarian Plain. The connection between the two cultures is the burial rite and a few items in the material culture that could be dated back to approximately the same period. The ethnic interpretation of these burial sites, which also set up a system of mixed argumentation, was based on the knowledge of the territory of the Gepids' residence after 454. On the other hand, the cemetery at Biharkeeresztes-Toldi útfél is clearly dated to the 6th century (middle or second half) and fits into the type of row-grave cemeteries. The three find places are practically a cross-section of the archeological culture of the 5th century Carpathian Basin, but its further development towards the 6th century remains questionable. With the help of published archaeological material, anthropological analyzes and archeogenetic studies we try to determine the relationship between the individual sites. The four sites and their relationship are important for studying the transitions between the Hunnic and the Gepidic periods.

### 2 THE MAGYAR RAIDS INTO ITALY: THE SLOVENIAN 'PASSING' PERSPECTIVE

**Author(s):** Janzekovic, Izidor (Central European University)

**Format:** Oral

Any (Magyar) raid can be studied from three simplified geographical perspectives: 1. from the root region, i.e. within the Carpathian basin; 2. from the transitional region, i.e. the lands of today's Slovenia; 3. from the target region, i.e. the rich lands of Italy. While there has been a lot of research in and on the first and the third region, the second has received very little attention so far. Thus, the traces of Magyar (raids) from the territory of today's Slovenia have been gathered and analyzed. Since the particular Magyar raids into Italy in the late 9th and the first half of the 10th centuries were only relatively briefly recorded by the contemporary Western and Eastern 'reporters', archaeology can provide a key for further interpretation. Can we interpret 'Magyar' artefacts as the trace of raids, or could they be interpreted as the traces of tribute and trade?

The Magyars, not completely unlike Normans and Saracens, were very interested in looting rich lands of Italy, particularly the un-fortified churches and monasteries. Roman roads, or remnants thereof, were widely used, and Magyar raids very likely took the same route. Roman road system fostered great movements of people and trade, often not to Rome's advantage. Between 898 and 954, the Magyars had to cross Slovenian lands to reach Italy at least 26 times. However, there are surprisingly little 'Magyar' artefacts discovered in this region: a few arrowheads (Tonovce grad pri Kobaridu, Zidani gaber nad Mihovim, Lajh v Kranju), stirrups (Gradišče nad Trebenčami, Tabor pri Tomaju, Ljubična nad Zbelovsko goro, Ljubljana) and a possible destruction layer (Bled). What can these traces tell us about the attitude of Magyars towards the 'passing' region?

### 3

## STRONTIUM ISOTOPES AND EQUESTRIAN MOBILITY IN THE HUNGARIAN BRONZE AGE

**Author(s):** Kanne, Katherine (Northwestern University)

**Format:** Oral

I present the results of a comparative study of equestrianism in the Hungarian Bronze Age which integrated strontium isotope analysis of horses from seven tell settlements with the study of human and horse remains and their related material culture. Strontium isotope analysis was a key component in establishing regionally local horse production, but that a few horses were either ridden or traded into tell societies far from their birthplace. This supported increased equestrian interconnectivity at a supra-regional level. Used alone, this could support existing theoretical models of the Hungarian Bronze Age. However, when included with all lines of research, the isotope evidence suggested local use, travel on and trade in horses that was not under the auspices of an elite class of warrior rulers.

In this case, the methodological integration of stable isotope analysis with multiple lines of evidence forced a reexamination of Bronze Age narratives of human-horse relationships that have particular consequences for traditional explanations of political authority. There has long been the assumption of horses driving the development of the complex tell societies of the Hungarian Bronze Age, as part of a 'chariot package' that allowed for warrior aristocracies to rule the tells and control the bronze trade. The lack of any obvious linkages of horses with elites, the lack of any evidence of chariots, and the fact that riding was widespread and not restricted by class or gender forces a reinterpretation of the roles that horses played in the Hungarian Bronze Age. This confirms the need to have a detailed comparative and contextual understanding of the animals and humans involved in biogeochemical studies when used in the formation of broad narratives of European Prehistory.

### 4

## SPATIAL PATTERNS OF 6TH-8TH-CENTURY WEAPON BURIALS IN THE CARPATHIAN BASIN

**Author(s):** Csiky, Gergely (Archaeological Institute of the Research Center for Humanities)

**Format:** Oral

The Avar Age in the Carpathian basin covering the period between 568 and the beginning of the 9th century represents an era of row grave cemeteries with a large number of weapon burials. Various studies have been performed both on the weapons and their context so far, however, their spatial analyses remained superficial or neglected. In a monograph written on Avar-age close combat weapons, I limited my observations on some regional peculiarities of their distribution without exploiting the possibilities of the 55 distribution maps printed in this volume. A recently published book of Csanád Bálint focused on spatial problems of the Avar archaeology based on formerly published maps without using any tools of spatial analyses provided by GIS.

The proposed paper aims to fill this gap not only from a geographical but also from a social perspective. These burials are especially precious in the field of social archaeology since the deposition of weapons can indicate high social prestige or status. Some researchers even tried to detect power centres by using the outstanding number or proportion of weapon burials in some cemeteries.

The spatial analysis of weapon burials is a multi-level process starting with the assessment of the site's type, size and integrity and followed by the study of the weapon burials' distribution between grave groups in a cemetery. The spread of weapon burials on a micro-regional level can reveal a hierarchy between the sites as well as landscape archaeological features such as the relation to earlier sites or features of physical geography including hydrography, relief or land cover. Regional analyses on Avar archaeology rested on pre-defined areas such as Transdanubia, Great Hungarian Plain etc. Using various tools provided by GIS, I aim to outline regions based on the data itself.

### 5

## THE KUSHNARENKOVO CULTURE IN WEST SIBERIA: AN ILLUSION OR REALITY?

**Author(s):** Zelenkov, Alexander (University of Tyumen)

**Format:** Oral

The report presents the results of studying an original group of ceramics, fixed in historiography as evidence determinates genesis of the Kushnarenkovo culture in West Siberia. The last sentence gives a reason to compare the archaeological heritage of the ancient Magyars with medieval Siberian artifacts. If the Kushnarenkovo culture from Bashkortostan no doubts has connections in the Karayakupovo materials (ancient Magyars), it's a Siberian version with no monuments just ceramics.

As a result, ceramic strata analysis proves the impossibility to point ""Kushnarenkovo"" pottery as an independent horizon. I suppose these shreds are examples of pottery imported by separate nomads groups from Asia steppe (the Dzhetyasar culture) because it does not form series and sequences into the context of medieval hillforts and settlements. The hypothesis was confirmed by the statistical analysis of the funeral rite, where the graves with ""Kushnarenkovo"" vessels did not form a specific group. A different origin of this pottery tradition is proved by morphological analysis, where the samples of ""Kushnarenkovo"" vessels from the burial sites (Ust-Tara-7, Pereyma, Ustyug-1, and Revda-5), showed a clear difference from the Potchevash, Bakal and Karym types of ceramics which were traditional for West Siberia. As a result of these data, I propose to call this pottery type as "pseudo-Kushnarenkovo", presumably having its origins in the Central Asia steppe region and the Southern Urals, considering it to material evidence of migrations. In the context of the early stage of the Magyar's cultural origin, accepting the hypothesis about the Kushnarenkovo culture (Ural version) as a part of this process, it could be an opportunity to estimate a level of nomad's impact during the period of the 4th – 7th centuries AD for a whole Ural-Siberian region.

6 JOINTIME, BRONZIZATION AND THE CRUCIBLE WHAT IS THE CARPATHIAN BASIN

**Author(s):** Daróczi, Tibor (Aarhus University, Department of Archaeology & Heritage Studies)

**Format:** Oral

Bronzization has been theorised as the gloabalisation of Bronze Age in Afro-Eurasia, which is envisioned as an overarching phenomena characterised by heightened and unprecedented connectivity with complex and web-like directionalities of circulation of goods, people and, implicitly, ideas. The transculture of the age is bronze, while the desire to acquire it, both as ingredients, ingots or finished products over vast regions is the primary motivator. While there is a general agreement on the existence of the above mentioned heightened connectivity, the means by which the directionalities are documented and highlighted are still in the works. joinTime developed methodologies by which the above research questions are addressed. The cornerstone of any directionality and networking issues is chronology. Relative chronologies, both of pottery and metals, do provide a frame to some extent, but it has become quite clear in the past decades that a certain gap exists between the two. Radiocarbon dating would seem to be the common denominator for both relative chronologies, directionalities of metals and the agencies there of. The consolidation of radiocarbon dated Bronze Age funerary contexts from the study region, doubled by the newly dated graves with metals by joinTime elucidate the murky picture of networking and connectivity through metal finds, horse gear and multi-stratified settlements. Moreover, in some instances connectivity to neighbouring and further lying regions are also indicated.

7 THE HOUSE WITH A ROUND LAYOUT FROM TATABÁNYA-DÓZSAKERT

**Author(s):** Némethi, János (Pázmány Péter Catholic University, Institute of Archaeology, Budapest)

**Format:** Oral

Pit dwellings with round layouts have been a long-debated topic in the archaeology of the early Magyars. In the late 19th century, scholars thought that the conic shaped river cane huts of Hungarian shepards and cattle herders came from conquest era buildings, and were related to traditional finno-ugrian round lavvu tents. Proper archaeological investigation of Árpád-age rural buildings began in the 1950's by István Méri, rewriting these theories. However, the few dwellings with round layouts that do exist – and their possible relations to the nomadic yurt – remain an interesting topic.

The round building of Tatabánya-Dózsakert was excavated by Gábor Vékony in 1993. He believed it was a more settled, dug in version of the felt yurt, based on the works and beliefs of Gyula László. The building itself consists of a pit about 0,5-0,7 meters deep and 3,8-4 meters in diameter. The remains of two clay ovens could be seen within it. The clay floor also had two layers. At the outlines of the floor, 17 pole holes were found, referring to wattle and daub walls. The building most likely had a thatched roof.

Some other Árpád-age round buildings have also been excavated in the Carpathian basin. Among these, the dwelling of Tatabánya represents a rather unique version. Eastern analogies can also be found, the closest are from the Don and Donets region (Krimskoje Gorodische, the left bank Cimljansk fortress, Novalimarivska, Dmitrievskoje). Another close analogue is Biljar at the central flow of the Volga.

Finds in the round building of Tatabánya mostly consist of pottery sherds typical of the 10-11th century. One fragment, however, is the shell-shaped handlepiece of a clay cauldron, which has analogies both in the late Avar period of the Carpathian basin and in the Saltovo culture.

a. THE HUNGARIAN CONQUEST PERIOD: WEST SIBERIA CONTEXT AND ARTIFACTS

**Author(s):** Tretjakov, Evgeny - Prokonova, Maria (University of Tyumen)

**Format:** Poster

The period of the second half of the 9th century is also associated with the spread of monuments of Yudino culture in the territory of the West Siberia. Ornaments, belts, weapons, horse harness and household equipment of the Yudino culture reflect the cultural ties with the neighboring populations. For example, such complexes as the Vak-Kur and the Pesyanka 1, in addition to the typical "local" West Siberian casting, contain types of artifacts that had origin in the Cis-Urals and Altai. Thus, finds similar to those found in the cemeteries of the Perm Kama region. Things that are common among carriers of Srostkino culture are associated with the Altai and the Upper Irtysh Region. A similar situation we see in the materials of the Uelgi and Sineglazovo burial grounds. An important problem is that during the publication of these sources, the general set of highly artistic toreutics is mainly demonstrated, but it is not distributed within the complex, which almost completely deprives the findings of the context and is doubtful when identifying a specific stylistic group with specific ethnic groups. Despite this fact, materials of different origin are often found in the same burials on Vak-Kur. It is not uncommon for belt sets to contain buckles of the Sroskin type, and the plates were clearly of the Kama region origin. Besides, the characteristic finds of the Subbotsy horizon, like belt plates with floral ornaments and gilding, were found in the materials of these complexes. Thus, we can assume that the Trans-Ural materials of the 9th – 10th centuries AD most likely reflect the cross-cultural processes associated with the movement of material culture through the communication of the medieval population than the presence of specific ethnic groups of this time, in particular, Magyars, in the Trans-Urals and Western Siberia.

b. EARLY MEDIEVAL HILLFORT OF PRÁCHEŇ (CZECH REPUBLIC): NEW DATA AND NEW FINDINGS

**Author(s):** Pták, Martin (Department of Archaeology, Charles University in Prague; Institute of Archaeology, University of South Bohemia) - Klápště, Jan (Department of Archaeology, Charles University in Prague) - Ptáková, Michaela - Komárková, Veronika - Kovačiková, Lenka (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia)

**Format:** Poster

The contribution presents an ongoing project on a comprehensive analysis of archaeological, archaeobotanical and archaeozoological data from early medieval hillfort Prácheň near Horaždovice (Czech Republic), which represents an important central place within the Přemyslid castle system in the younger phase of the early medieval period. A number of archaeological excavations have been performed at the hillfort site and its hinterland. A series of small-scale surveys is still being carried out. The research questions concerning the hillfort fortification, extent and the structures of the outer bailey are examined on the basis of archaeological and environmental evidence. The natural scientific analyses play an important role in the study of the economy of this important early medieval centre, a special emphasis is devoted to the study of agricultural and non-agricultural production. The results are compared with data obtained from other early medieval fortified settlements in the region. Furthermore, the issues of a transformation of the hillfort into the high medieval castle, which was established in the hillfort acropolis, the surviving of the hinterland settlement and the emergence of the nearby town of Horaždovice in the 13th century are solved.

c. HARNESSES IN THE LANGOBARD CEMETERIES IN PANNONIA

**Author(s):** Szucs, Melinda (Hungarian National Museum / Magyar Nemzeti Múzeum)

**Format:** Poster

In the Merovingian era the deposition of horses and harnesses into human burials is a well-known ritual all over Europe. In Pannonia 27 horse or rider burials are known from 18 cemeteries from the langobard era (6th century) and from these findings in all 31 artefacts known, as pieces of harnesses.

Two factor complicates the research of the burials and items. First of all, in the Carpathian-basin the items from wood, leather and other natural materials decomposes in the ground, so we can study only the metal parts of harnesses. On the other hand, the grave robbery is common in the langobard cemeteries, so the objects are not in situ, or the harnesses are broken or have missing pieces.

The most of these objects are horse-bits, but we can identify buckles and decorative elements, and some of the items refers to the saddle. The findings from Veszékény and Hauskirchen are really impressive parts of the langobard goldsmith's art. The harnesses from Veszékény are really good examples of the I. Germanic animal style.

The horses and harnesses are mostly buried with males, but sometimes we can find them in female burials too. Its really interesting, that the richest and most beautiful harness findings belongs to woman.

511 GENERAL SESSION - SETTLEMENTS

**Theme:** 1. Networks, networking, communication: archaeology of interactions

**Chair:** Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

**Format:** Regular session

ABSTRACTS

1 THE SOCIAL STRATIFICATION IN THE AL-ANDALUS LANDSCAPE (10TH-11TH CENTURIES)

**Author(s):** Berrica, Silvia (Universidad de Alcalá)

**Format:** Oral

With this poster, we would like to indicate the new social dynamics that we are experiencing in the central area of the Iberian peninsula, at a particular time in the Islamic state, which includes a period of transition between the era of the caliph and the formation of the states of Taifa.

With the help of the study of the landscape, we have been able to differentiate some of the social and economic diversities of this territory, cataloguing the diversity of the sites that are distributed along the region. This allowed us to better understand the dynamics of the territory and therefore to understand that the settlements that we were able to investigate were different and each of them was assigned a particular role in the economy and the hierarchy of local settlements. The spatial perspectives of the landscape and the positioning of the different settlements are crucial for understanding the dynamics of evolution that reflect the society that inhabited them and in this case also reflect a hierarchy in the distribution and differentiation of inhabited centres. Without a doubt, the eleventh century is a period of profound changes, which breaks with the parameters of the early medieval society, while yes, it will come ever closer to the cultural criteria of the Low Medieval period.

2

**WHY IS THIS EMPTY? THE ROLE OF OPEN SPACES IN IRON AGE FORTIFIED SITES: CASE STUDIES FROM GERMANY TO SPAIN**

**Author(s):** Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

**Format:** Oral

While open spaces have long been recognised as a characteristic feature of many Iron Age fortified sites, their interpretation remains debated. Some scholars see large ‘empty’ areas as an indication of unfinished settlement projects, whereas others emphasise their deliberate openness as an element aimed to allow activities that can range from agricultural production to spaces for population refuge, political gatherings or religious performances. Rather than providing general answers, we need contextual analyses that do justice to the variety of possible scenarios, as well as approaches that search for structural elements within certain geographical and/or chronological contexts. This paper will exemplify this complexity and the need of multi-scalar approaches on the basis of three cases studies: 1) the Early Iron Age hillfort of the Alte Burg near the Heuneburg in southwest Germany; 2) the public spaces in the territory of the Late Iron Age Treveri in eastern Gaul; and 3) the ‘acropolises’ of Late Iron Age hillforts in north-western Iberia.

3

**EMPTY SPACES OF THE ROKŠTEJN CASTLE**

**Author(s):** Mazackova, Jana - Vaněčková, Daniela - Žaža, Petr - Púčať, Andrej (Masaryk University)

**Format:** Oral

Rokštejn castle in the Bohemian-Moravian Highlands (Czech Republic) is connected with medieval colonisation processes undertaken by the aristocratic families during the establishment of their lordships. The castle itself architectonically started as a simple keep within a great stone wall with a small bailey surrounding the eastern part of the rocky outcrop with the keep. The following architectonical castle phases evolved into two-palace disposition, keep, three towers on main wall and zwinger and of course the other enclosed bailey. The owners of the lordship are important for the usage of the castle spaces because of their political stability as different owners had different usage of the Castle’s spaces. The Castle’s open spaces are something different from its empty spaces, which could have been covered by roof or could have been open. The Castle’s destruction enclosed the last empty and/or open spaces, and as such we can reconstruct the difference between open or empty spaces.

a.

**BEFORE THE CITY. SOCIAL DIFFERENTIATION IN THE EARLY MEDIEVAL SETTLEMENT OF HÂRȘOVA (SOUTH-EAST ROMANIA)**

**Author(s):** Stanc, Simina Margareta (Alexandru Ioan Cuza University of Iași) - Paraschiv-Talmațchi, Cristina (Museum of National History and Archaeology Constanța)

**Format:** Poster

Archaeological research undertaken in the settlement of Hârșova offers the opportunity to observe occupational relationships and incipient social differentiation between and within communities. The evolution of the settlement from the foundation to the moment of abandonment (end of the 8th - 10th century) is analyzed.

On the investigated surface, no signs of a clear social stratification were discovered, but changes were observed in the settlement plan and in the interior arrangement of some of the houses, also a spatial arrangement of some social groups, according to the activities they have performed. Thus, most fish bones and weights for fishing nets were discovered on the lower terrace (towards the water), a probable arrangement, within the settlement, of the fishermen. The discovery of a consistent number of bones from large and medium-sized domestic mammals shows that animal husbandry was an important activity in the settlement economy. The animals also represented a source of raw materials, as revealed by the inventory of a space with craftsmanship role, consisting of numerous faunal materials, raw or in progress (red deer antlers, wild boar fangs) and a shale chisel. Most pots of supply, sometimes with numerous copies in the same home, were discovered in the northwestern part of the settlement. Here could be the group of those who practiced agricultural activities. Also, here were discovered most of the slabs with concavity in the middle and some round stones, strongly chopped in the part used for crushing cereal seeds, as well as pits for storing supplies.

Externally, by comparison, we observe the transformations that passed the settlements from the Lower Danube in and after the 8-10 centuries. It was observed how in Hârșova, as well as in other settlements on the Danube line, starting with the 11th century, the rural landscape gives place to the semi-urban one.

512

**GENERAL SESSION - GENDER IN FUNERARY CONTEXT**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Chair:** Sanchez Romero Margarita (University of Granada)

**Format:** Regular session

**ABSTRACTS**

1

**ON THE PAPER AND IN THE GROUND. INTERDISCIPLINARY STUDIES ON MATERIAL CULTURE OF POMERANIA (POLAND) ON SELECTED EXAMPLES. WOMAN CLOTHES**

**Author(s):** Grupa, Malgorzata (Institute of Archaeology, Nicolaus Copernicus University in Torun) - Nowosad, Wiesław (Faculty of History, Nicolaus Copernicus University in Torun)

**Format:** Oral

Material culture of modern times has been a subject of interest of historians and archaeologists for years. It is represented in museums as works of art and various objects of everyday life. Many of these artifacts are a direct result of archaeologists work, who explore urban sites and churches of smaller settlements. Despite these wide range explorations we still know little about woman clothes from 16th century till the beginning of 19th century. Clothes conventions established at the end of 19th century and the beginning of the next century are perceived as patterns in science and not many researchers try to verify or complete them, concentrating rather on selected problems and small groups of representatives – the most often royal court or aristocracy. And what about life and dresses of women from the province? Was a dress of a townswoman much different from clothes worn by a noblewoman? Did women inhabiting villages always wear modest or poor clothes? What about underwear and is it readable in archaeological material? These questions appear when we compare the latest results of archaeological research with archive sources, which have been preserved in manuscripts only till our times, and are not known to the public.

2

**AN INNOCENT SOUL BECOME AN ANGEL. NEWBORN BURIALS IN MEDIEVAL AND POST-MEDIEVAL BOHEMIA**

**Author(s):** Cechura, Martin (The Museum of West Bohemia, Pilsen)

**Format:** Oral

Graves of infants and children belong to a specific category of medieval and modern-age burial culture. Special zones have been identified at a number of archaeological sites in Czech Republic dedicated to burying new-born babies. These zones are often located near a church, but their location is quite variable. However, there are other specific places in the cemetery area. The most important of these are burial places near the cemetery wall, both inside and outside, or even in recesses of the cemetery wall. There is also a special case of desecrated or more or less dilapidated churches. Specific are also multiple graves of a child and an adult. In interpreting the archaeological facts it is necessary to use other types of sources, especially written and ethnographic, bearing in mind the great variability of the written sources, which for each archaeological phenomenon offer more varieties of interpretation. The result of the archaeological analysis is the finding that the burials of deceased new-born babies required special treatment and were given great attention. Whatever the reasons, this fact illustrates a clear understanding of the childhood category since birth, and the strong emotional bond linking parents and deceased children. In these examples we see a strong effort to secure the new-born a respectable funeral in the cemetery.

3

**CHILD BURIALS IN MYCENAEAN CHAMBER TOMBS FROM GLYKA NERA, ATTICA**

**Author(s):** Vrettou, Irene (Ministry of Culture and Sports)

**Format:** Oral

Among the newest discoveries of the Mycenaean cemetery of Glyka Nera are two chamber tombs which were excavated between the years 2007-2012. The first one hosted a single child. The gifts that accompanied this burial date it to the beginning of the LH IIIB period. The second chamber tomb contained 23 burials, male, female and children. More specifically, children remains of various ages were discovered in pits inside the burial chamber and among swept away bones. The tomb was used mainly during the LH IIIA2-B1 period.

In this study we will first present the findings that are related to the child burials of both tombs and led us to identify them as such. Subsequently and more importantly, we will try to examine the similarities and contrasts between the two chamber tombs, the distinct manner in which each child was buried and the reason why their families chose that manner. The results will give us important information about the customs of child burial and the social conditions in the region of Glyka Nera during the LH IIIB period.



4 IT’S COMPLICATED: SEX, GENDER AND BRONZE AGE BURIALS

**Author(s):** Rebay-Salisbury, Katharina (Austrian Academy of Sciences) - Bas, Marlon (Austrian Academy of Sciences, Institute for Oriental and European Archaeology; Medical University of Vienna, Unit of Forensic Anthropology)

**Format:** Oral

As a component of identity, gender is based on sex – the inherited, biological differences between males and females necessary for reproduction – but not identical to it. Traditionally, archaeologists have distinguished between (biological) sex and (cultural) gender, but the relationship between the two remains complicated. Gender, the cultural interpretation of sexual difference, is both an embodied, lived experience and a social categorization. Biological sex is also part of the social discourse and does not exist independent from it.

The bodies we encounter in burials are usually assigned male or female sex based on morphological characteristics of the skeleton, which are shaped by biological, social, and environmental interaction; it is not normally possible to assess the sex of children before puberty this way. In recent years, however, the analysis of sex-specific gene segments and peptides in dental enamel have enabled the identification of chromosomal sex with a high degree of certainty (intersex variations and disorders of sex development still cannot easily be recognized).

These analytical advances present fresh opportunities to investigate sex-b(i)ased differential treatment of children: investigations of infanticide, health, growth and trauma can now integrate a gender dimension; we can analyze if burial practices and material culture were different for girls and boys, and begin to understand how gender roles were learned.

However, does an ever more accurate understanding of a buried person’s sex lead to a better understanding of gender? How can we avoid a tunnel vision of gender generated by graves? Can we constructively build on scientific advances of sexing without losing sight of gender concepts beyond the male/female dichotomy? In this contribution, I will discuss these questions to gain a better understanding of how sex, gender and age interlinked in Bronze Age Central Europe.

5 POSTHUMOUS PORTRAITURE: ELITE FEMALE BURIALS IN IRON AGE EUROPE

**Author(s):** Stanton, Emily (University of Wisconsin - Milwaukee)

**Format:** Oral

Paul Treherne has suggested that in Bronze Age Europe the phenomenon of the “warrior burial” represented a male “death-style, a socio-culturally prescribed way of expiring” (1995: 106). However, Treherne largely glosses over the possibility of female death-styles. As part of my ongoing dissertation research, I explore the possible meanings of the assemblages found in elite female graves of Iron Age Europe. In particular, I focus on the late Hallstatt period through the early La Tène period (c. 750 to 400 BC) in the Heuneburg hillfort interaction sphere in southwest Germany. The standardization of grave good assemblages for high status adult women in this region suggests that these grave goods constituted a socially prescribed way of being dressed in death. For a subset of the high-status adult women of the Heuneburg interaction sphere, staple-decorated sheet-bronze belt plates, in combination with sets of hair-pins and rings, represented a “proper burial,” an elite female death-style. I will explore several hypotheses regarding the possible meanings of this post-humous portraiture and its potential connections to aspects of the deceased’s identity and role, including gender, age, kin relations, and childbearing status.

6 AUDIENCE’S OCCUPATION OF FUNERARY SPACE AND ITS SOCIAL EFFECT

**Author(s):** Kim, Jinoh (Seoul National University)

**Format:** Oral

Funerary data are none other than the traces of funerary events which once occupied the real time-space. They hardly took place by themselves, for every performance has its audience. Through the case study of the cemetery sites in southeastern Korea from the 1st century BC to 3rd century AD, I focus on the role of audience as interpreters who inhabited the real time-space of funerary events. How human bodies actually occupied it by interacting with the material world around them is described. Then, I discuss how this bodily interaction might have encouraged them to understand their world in certain ways, which resulted in the legitimation of social inequality. Until the middle of the 2nd century, the grave pits had been generally deep and narrow, with little difference in size among them. All graves of a cemetery had been located on the same plane of a gentle slope. But those with prestigious items had kept much space to the preceding graves, which may show the number of the audience around them during the interment ceremony. By the late 2nd century, graves with extremely large pits and large amount of grave goods emerged. These superior ones were laid in a row along the top of a mountain ridge while the inferior ones on its side slope. The expansion of pit size and grave goods might have had the effect of showing off prestige to the audience, but their location on the narrow ridge might have limited the number of visitors to the inhumation ceremony. Those who were not invited might have had the chance of witnessing the prestige during the funerary procession. The prestige display and spatial differentiation during the funeral might have triggered the audience’s ‘bodily semiosis of symbolic power’, the unwitting internalization of social hierarchy.

7 PLACING THE DEAD: NECROSCAPES IN EARLY MEDIEVAL BRITAIN

**Author(s):** Brookes, Stuart (UCL Institute of Archaeology)

**Format:** Oral

The sheer variety of funerary rites and practices practiced by the communities of early medieval Britain and Europe in the mid-first millennium AD, suggests an increased interest and investment in the disposal of the dead particularly in the fifth to seventh centuries. The visual theatre of the funeral was likely enhanced by the introduction of cremation and furnished inhumation traditions. The intriguing practice of adopting visibly striking older monuments as burial foci also became popular in many regions. Taking the idea that the funeral was a visual act, a performance orchestrated by and for the living, this paper explores how the cemetery spaces created over time by the early medieval populations of northern Britain contributed to the experience of living visitors and if the dead were agent in the development of these cemeteries as experiential places.

Using five cemeteries established and developed during the fifth to seventh centuries AD we will investigate how the living developed these places, and how the individual biographies and social connections of the deceased may have influenced their choices and actions. We ask if the choice of cemetery setting may have influenced the design and development of the architectural spaces of burial sites and if the act of burial served to develop and enhance the experiential qualities of the locale. We take into consideration the ways in which the spatial plans of our cemeteries developed over time and if burials were grouped or located according to social and bioarchaeological attributes. We examine the ways the graves were created, furnished and marked out and test out the visual architecture of these spaces, exploring if the dead were instrumental in choreographing the experiences of access, movement and visibility for the living.

a. HISTOLOGICAL RECONSTRUCTION OF JUVENILE AGE-AT-DEATH IN MEDIEVAL CANTERBURY, UK

**Author(s):** Mahoney, Patrick (University of Kent; Skeletal Biology Research Centre) - McFarlane, Gina - Deter, Chris (University of Kent)

**Format:** Poster

Reconstructing age-at-death is often a starting point for studies of human growth and development in an archaeological context. One way of achieving this for juvenile skeletons is to compare their stage of post-natal dental development to modern day standards created from radiographic studies or visual observations of dental development in living children. Dental histology offers an alternative approach to age estimation when skeletons are recovered with teeth that are still developing. The advantages of this method are that age-at-death is determined directly from the skeleton, and histological reconstructions are typically accurate to within a few days or a week of the actual age-at-death. This study reports histologically derived post-natal age for tooth formation stages (crown half, crown complete, root one quarter), and the age at which alveolar eruption occurred, for permanent first lower mandibular molars from ten juvenile skeletons excavated in Medieval Canterbury. These skeletons were selected because alveolar eruption coincided with age-at-death. Enamel crown formation time and root formation time were calculated for each molar using standard histological methods. Results are compared to modern day standards.

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GENERAL SESSION - CERAMIC AND OTHER TECHNOLOGIES

Theme: 5. Theories and methods in archaeology: interactions between disciplines

Chair: Herold, Hajnalka (University of Exeter)

Format: Regular session

ABSTRACTS

1 SEABORNE MOBILITY IN THE BRONZE AGE. AN ARTEFACT-BASED STUDY FROM THE ADRIATIC AREA.

**Author(s):** Arena, Alberta (Sapienza Università di Roma)

**Format:** Oral

From a purely archaeological point of view, mobility – and its fluctuations over time – can be investigated through the filter of the distribution of artefacts. In this respect, the Adriatic basin represents a privileged case study. Contacts between its two shores are attested at least since the Early Neolithic, and such a phenomenon characterizes all phases of prehistory, each period bearing its own peculiarities.

This paper analyses trans-Adriatic interactions from a diachronic perspective (from the end of Early Bronze Age to the Recent Bronze Age, 1850-1150 ca B.C.E.) and it is based on a typological and archaeometric study of ceramics from the Italian and Balkan Peninsulas. During the central centuries of the Bronze Age, interactions between the western and eastern coasts of the Adriatic basin seem to reach an unprecedented scale and intensity, as suggested by imports, local imitations of trans-Adriatic models and hybridizations between different prototypes. In some Northern Apulian sites (e.g., Trinitapoli), the percentage of Dalmatian models in the archaeological record is extraordinary, accounting for nearly 50% of all the vessels recovered at the site. Such extraordinary intense mobility between the two coasts clearly had a high impact on the communities living on the two shores or in nearby sites. For these reasons, this case study also offers an ideal opportunity to discuss the potentials and limits of some traditional archaeological methods

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largely applied to investigate interaction dynamics.

### TECHNICAL AND TECHNOLOGICAL ANALYSIS OF POST-NEOLITHIC CERAMICS OF THE FOREST MIDDLE VOLGA

**Author(s):** Andreeva, Olga (Samara State Socio-Pedagogical University)

**Format:** Oral

The Middle Volga region is located in the European part of Russia. Post-Neolithic Krasnomostovskaya ware exhibits a range of differences from Neolithic ceramics of the Volga region. However, at the sites of this culture there are no signs of the early metal age.

The study of the technology for the production of Krasnomostovskaya ceramics was carried out according to the method developed by A.A. Bobrinsky. The historical and cultural approach involves the identification, accounting and study of specific labor skills with which ceramics were made.

Fragments from 114 vessels of Krasnostost were analyzed: Red Bridge II, III; Pine Mane III, Dubovskaya VIII. Its chronological framework fits into the interval from 4250 to 3900 years of armed forces. This ceramics is represented by vessels ornamented with a comb stamp and pits.

For the manufacture of dishes, clay 76% and silty clay 24% were used as the initial plastic raw materials (PRM). The materials were selected plastic raw materials (slightly sandy) 84%, less often sandy 16%. Krasnostovsk ceramics are characterized by raw materials in a naturally moistened state - 98%. The following were selected as artificial additives: chamotte (CH); organic solution (OS). Potters on three recipes: IRM + OS + CH (0,5-3 mm) – 65%; IRM + OS + CH (more 3 mm) – 32%; IRM + OS – 3%.

The heterogeneous views indicate the formation of the Krasnostost population as a result of mixing at least of two population groups. Before the appearance of the Krasnostostovsk region, two Neolithic cultures were represented in this region: Kama and pit-comb ceramics. The interaction of these population groups led to the formation of pottery of the Krasnostost type.

Project: RSF № 19-78-10001.

3

### THE CERAMIC PRODUCTION OF CÓRDOBA (ANDALUSIA) IN THE 16TH-17TH CENTURIES. ARCHAEOLOGICAL STUDY AND FIRST ARCHAEOMETRIC CHARACTERISATION

**Author(s):** Llorens, Marta - Buxeda i Garrigós, Jaume - Madrid i Fernández, Marisol (Universitat de Barcelona)

**Format:** Oral

During the modern era, the city of Córdoba, in the South of the Iberian Peninsula, experienced a series of important social and economic changes due to the conquest of the Nasrid Kingdom of Granada by the Castilian Crown and the Spanish expansion to America. Nevertheless, the ceramic production of the 16th and 17th centuries in Córdoba has been little studied and the workshops related to this period have been mainly explored in urban rescue excavations. This work aims to provide new enlightening data about the production centres and the distribution of their pottery in Andalusia and the American colonies. The archaeological data from the excavations of kilns and workshops has been gathered and their productions have been profusely studied. Besides, 60 individuals have been chemically characterised by means of x-ray fluorescence analysis (XRF) and mineralogically by means of x-ray diffraction analysis (XRD).

This project forms part of the more extensive Tecnolonial research project (Technological impact in the colonial New World. Cultural change in pottery archaeology and archaeometry – HAR2016-75312-P), in the frame of which several ceramic production centres of the Iberian Peninsula from this period have been studied. The incorporation of more archaeological workshops such as Córdoba allows us to deep knowledge of the complexity of pottery production and distribution over the entire Iberian Peninsula and the American colonies between the 16th -17th centuries. In the present communication, we will present the first results of this case study.

4

### SUPPLYING BLACK GLOSS POTTERY TO THE CITIES OF NORTHEASTERN HISPANIA DURING THE LATE REPUBLIC: AN ARCHAEOMETRIC APPROACH

**Author(s):** Madrid i Fernández, Marisol (University of Barcelona) - G. Sinner, Alejandro (University of Victoria)

**Format:** Oral

The colonization of Hispania by Rome fostered an enormous expansion in the economy of the indigenous peoples in this newly established province and opened to them the markets of the rest of the Mediterranean.

Late Republican Black Gloss Pottery is one of those imports that has long been the subject of discussion and debates among classical archaeologists. The abundance and importance of these ceramics –since they can be considered the first mass-produced Roman fine wares– and their efficiency as a method of relative dating has contributed to developing a whole area of research around them in classical archaeology. However, the great similarities on the grounds of their visual appearance together with a large number of workshops involved in its production, makes it difficult to distinguish these products only from the archaeological point of view.

In order to contribute to shed light on the complex world of the Black Gloss pottery distributed in the Iberian Peninsula, an archaeometric research program on several sites on NE Hispania has been performed. The main goal was to evaluate the extent of the contacts between this area and the Italian Peninsula, their commercial circuits and the cities and regions involved in those exchanges. The analytical study includes so far, a sample of 172 individuals characterised chemically and mineralogically by means of x-ray

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fluorescence and x-ray diffraction as well as microstructurally by using the Scanning Electron Microscopy.

Provenance aside, the paper presents the results of several aspects of the fabrication such as the selection of raw materials, the application of the slip, or the firing process among others. All these elements impact heavily the look of these ceramics and their archaeological classification that in many cases is key for dating archaeological sites.

5

### A CROSSOVER BETWEEN SPATIAL ANALYSIS AND CERAMIC TECHNOLOGY FOR THE BELL BEAKER PHENOMENON IN NORTHWESTERN FRANCE

**Author(s):** FAVREL, Quentin (Université Paris 1 Panthéon-Sorbonne; UMR8215 Trajectoires)

**Format:** Oral

The Bell Beaker phenomenon is well represented in Northwestern France. The recent reactualisation of previous inventory by different researcher (Favrel 2015; Gadbois-Langevin 2016; Rousseau 2015) shown a huge increase in discoveries by taking in account the development-led archaeology. More than 400 sites and 3500 ceramics have been associated to the phenomenon, allowing a closer approach in the spatial distribution of Bell Beakers in Northwestern France. We built a database for the Bell Beaker sites and ceramics in Northwestern France in order to work on chronological and spatial distribution of the ceramics in our PhD thesis. As new typochronological models have been made recently (Favrel 2015; Blanchet et al. 2019) the following step is to work on the spatial repartition of the different ceramics styles. Thus our first attempt is to question the homogeneity of the Bell Beakers inside northwestern France, and then with neighbouring area by mapping the discoveries. This will allow to replace the development of the Bell Beaker phenomenon in northwestern France in is European context. Secondly a crossover approach will question the weight of the different networks defined by A. Gallay (1979; 2001) in order to see wich one are the more prevalent in our study area. To conclude we will take in account the technological study on ceramics we conducted, to compare specific part in the building of the vases (choice of temper, building technique, surface treatment, decoration technique, decoration motive or firing process), instead of looking them as a whole each time. As several Bell Beakers bear at the same time influences of the Rhine Valley and the Iberian Peninsula, like the Corded-Zoned-Maritime-Beakers for example, we hope that a technological approach crossed with network analyses will produce a more accurate vision of the various streams of influence encompassed by the Bell Beaker phenomenon.

514	<b>GENERAL SESSION - MULTICOLOURED ARCHAEOLOGY</b>
	<b>Theme:</b> 5. Theories and methods in archaeology: interactions between disciplines
	<b>Chair:</b> Alexandra Anders (Eötvös Loránd University)
	<b>Format:</b> Regular session

ABSTRACTS

1

### NEW RADIOCARBON AND OSL DATES FROM SOUTHWEST OF WALES AND ENGLAND HELP ILLUMINATE THE ORIGINS OF STONEHENGE

**Author(s):** Edinborough, Kevan (University of Melbourne, Faculty of Medicine) - Parker Pearson, Mike (Institute of Archaeology, University College London) - Pollard, Joshua (University of Southampton, Department of Archaeology) - Richards, Colin (University of the Highlands and Islands, Inverness) - Welham, Kate (Bournemouth University, Archaeology, Anthropology & Forensic Science) - Kinnaird, Timothy (University of Saint Andrews, School of Earth and Environmental Sciences) - Simmons, Ellen (University of Sheffield, Archaeology)

**Format:** Oral

We present the latest chronological results from ongoing excavations at the Waun Mawn stone circle in South West Wales and place them in a wider demographic context as part of the Stones of Stonehenge project. So far, forty-two samples of wood charcoal were measured the radiocarbon laboratories in Oxford (ORAU) and Glasgow (SUERC). An extensive program of Optically-Stimulated Luminescence (OSL) dating was also carried out on 11 feature profiles, consisting of 195 field- and 162 laboratory-profiling samples, enclosing 18 dating samples. Our results from both sets of analyses confirm that the stone circle was built in the fourth millennium BC, shortly before the first stage of Stonehenge, and that parts of Waun Mawn were dismantled in prehistory. We then place these new results in the wider context of the available chronological measurements from Southwest Wales and southern England. Following recent methodological advances, we use a well-tested simulation-based radiocarbon approach to systematically evaluate competing hypotheses regarding the origins of Stonehenge, in the light of all the available evidence. We discuss the importance of the underlying demographic processes involved.

2 **BRONZE AGE WOOL TEXTILE FROM THE SOUTHERN URAL REGION: 14C DATING AND ISOTOPE STUDY**

**Author(s):** Kuptsova, Lidia (Orenburg State Pedagogical University) - Shishlina, Natalia (State Historical Museum, Moscow) - Orfinskaya, Olga (Center of Egyptological investigation, Russian Academy of Sciences, Moscow) - Kiseleva, Daria (A.N. Zavaritsky Institute of Geology and Geochemistry UB RAS, Ekaterinburg) - Goslar, Tomasz (Poznań Radiocarbon Laboratory, Poznań) - Evgenyev, Andrey (Orenburg State Pedagogical University)

**Format:** Oral

To reconstruct traditions of the wool textile production process in the Southern Ural region during the Bronze Age, a technological analysis of 7 wool remains from five Bronze Age sites was carried out. To determine the precise chronological context of the woollen samples, three samples of textiles were submitted to direct 14C AMS-dating. Variability in the 87Sr/86Sr values for the wool textile analyzed samples, with respect to locally bioavailable strontium in plants was identified.

All woollen samples come from the Srubnaya graves which date to the beginning of 2000 BC. They are represented by pieces of woven textile, braids consistently produced from non-plied yarns. Technological analyses helped reconstruct that they were fragments of composite clothing or costume accessories. 87Sr/86Sr isotope data suggest that in several cases wool textile was locally made.

Thus, we assume that by 1900/1800–1700 wool technology and wool textile spread from the steppe and the forest-steppe areas of Eastern Europe to the east, i.e. to the Urals region and Kazakhstan. The research was supported by the RFBR grants.

3 **THE MEANING OF DIFFERENCE – CHANGES OF MATERIAL CULTURE IN THE EARLY IRON AGE**

**Author(s):** Gralak, Tomasz (University of Wrocław)

**Format:** Oral

Before any feature or item is made, there is always a project, which is then implemented. This is, therefore, actually a realisation of an idea in almost Platonic sense. Hence, searching for the causes of cultural change a cognitive analysis of the Hallstatt Period and the La Tène cultures' products was undertaken. As a result, it was found that in the first of them dominated the belief that everything consisted of many, usually very similar, elements. It is indicated by metrological analysis of buildings' plans. Geometric ornaments on pottery from this period were similarly designed, in this manner human and animal figures were presented as well. The results of the analysis meet exact analogies in the world structure description presented by Plato in the dialogue Timaeus.

The population of the La Tène Culture breaks this paradigm. In the material culture representation of sphere, circle, spiral or wavy line begin to dominate. They are the main ornamental motifs on everyday items. The explanation of this fascination with circle and sphere again can be found in the writings of Greek philosophers. According to some of them (e.g., Aristotle, On the soul) it is the shape of human soul and, in broader sense, the inner structure of the world.

4 **RELIGIOUS CULTS IN CYPRUS IN THE ACHAEMENID PERIOD: PHENOMENA OF CONTINUITY AND CHANGE IN THE ISLAND’S CULTURAL SUBSTRATUM**

**Author(s):** Puppo, Paola (MIUR - Ministero dell’ Istruzione, dell’Università e della Ricerca)

**Format:** Oral

The religious worship in Cyprus in the Achaemenid period shows a remarkable syncretism, often involving an unclear iconographic restitution of cult statues found. It can happen that the cult imported is modified to model the needs of the local substratum, that isn't determinable in Cyprus but there are various “currents” from the Syrian-Anatolian pressing on some religious depictions. In the late classical period (V century BC) we can quote a calcareous stone capital found in the room 47 of the Vouni Palace, a variety of Hathor Egyptian capital. But it is the Phoenician presence that also left several traces on the island, including the inscription CISI 95 = KAI 42, a text bilingual Greek / Phoenician inscribed on a rock wall to the northwest of the modern village of Larnakatis-Lapithou, with the dedication to the goddess Athena, who brings salvation and victory. The Phoenician text is a dedication to ‘Anat and to Ptolemy. The cult of ‘Anat is well represented in Laphethos, since V century BC; the name of the god also appears on a spear coming from sanctuary in Idalion dedicated to Athena. From an inscription of the year three of the king Ba’Imalok / Ba’Imilk (last quarter of the fourth century BC), discovered in 1887 in the Church of St. George, ‘Anat and Athena are represented as the goddess who saves from the dangers of war. In Kition in an inscription on a trophy, the god who presided over the victory is “Ba’l god of force”, assimilated to Apollo/Reshep. The Phoenician presence in Cyprus is also documented by five burials inscriptions in Phoenician in the cemetery of Minimata (Larnaca), which in the onomastic reveals the existence of a stable Jewish community, that had close trade relations both with the Greeks, with the Phoenicians and with local community.

5 **THE IRON AGE METAL ASSEMBLAGE FROM KHIRBET QEYAF A AND ITS CULTURAL AFFILIATION**

**Author(s):** Rabinovich, Alla (Hebrew University of Jerusalem)

**Format:** Oral

This paper presents the metal assemblage from the Iron Age settlement at Khirbet Qeiyafa - a relatively small fortified town in the Southern Levant south-west of Jerusalem, and discusses its social and cultural implications. The site is dated to the early Iron Age IIA, or early 10th c. BCE. Erected in a period of political instability, when new territorial kingdoms were crystallising and new identities were taking shape, the ethnic and geopolitical affiliation of Qeiyafa has been much debated. The excavators identified it as a Juda-

hite settlement on the border of the Kingdom of Judah, while other researchers connected it with the Kingdom of Israel or with a local Canaanite chiefdom. The metal assemblage collected from the Iron Age layer of the site gives an interesting perspective on this question; on the one hand, it includes typical examples of the Canaanite bronze work produced in the region since the Late Bronze Age, and on the other hand, the assemblage contains peculiar specimens that might represent a Cypriot influence, possibly through contacts with the Philistines. The iron objects found at the site, mainly knives and bracelets, shed light on the bronze/iron transition.

It is suggested that the use of iron at the newly established site of Qeiyaha characterizes the initiative of the central authority, be it the Kingdom of Judah or another political form, as much as the fortifications, the pre-planning and the administration do. The production and use of bronze, on the other hand, may indicate the presence of indigenous Canaanite population keeping the traditional bronze working, while touches of Cypriot/Philistine influence are noticeable in both metal industries.

6 **THE HOUSE-BUILDING PLANNING FEATURES OF THE MEDIEVAL POPULATION OF THE CIRCUMPOLAR REGION**

**Author(s):** Chikunova, Irina (Tyumen scientific center SB RAS)

**Format:** Oral

The study of the remains of medieval dwellings provides information about the lifestyle of the medieval population, the mechanisms of adaptation to the Northern climate, and economic activity. Housing construction is usually determined by landscape conditions, the main directions of economic activity, as well as the composition and number of family members. Usually winter dwellings with an earthen fence in the Middle Ob and Polar regions consisted of one special room for one family – in the Early Iron Age, in the Early and Late Middle Ages, as well as in ethnographic times. The good preservation of the Ust-Vasyegan 1 settlement allows the reconstruction of the appearance and internal structure of the medieval dwelling (Russia, Northern Ob region, the author’s excavations 2013-2015). The dwelling consists of 3 separate rooms with an area of 35-40m2. The wooden walls are reinforced and isolated from the outside by an earthen fence. The hipped roof is constructed of poles covered with birch bark, turf, and moss. The interior space is very clearly divided into zones: the kitchen and

working area in Room 1, –the bedroom and hearth in Room 2, each marked by different floor levels. The design of the hearth and sleeping places had a special wooden edging, which was reinforced with stones. All premises formed a single housing and production complex. This unique phenomenon can be explained by the need for a small space for life. It is the isolation and inaccessibility of this place, as well as fire, that preserved many nuances of housing

construction. Thanks to the research of this dwelling in the Arctic region, a contribution was made to the study of not only the methods of housing construction of the medieval population, but also ways to adapt to the harsh conditions of the North.

7 **IS THIS UNIQUE METAL FIND FROM A SHIPWRECK THE MISSING LINK IN THE DEVELOPMENT OF 17TH CENTURY TOILET SERVICES?**

**Author(s):** van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Beentjes, Tonny (University of Amsterdam) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - van Bommel, Maarten (University of Amsterdam)

**Format:** Oral

During the summer of 2009 a shipwreck was discovered near the Dutch island of Texel, containing a remarkable group of both organic and inorganic finds. More than 50 researchers from different disciplines are (still) involved in its study and since then, it has become evident that the group of finds belonged to a mid-17th century ship, most likely Dutch but still of unknown origin and destination. Especially the pristine condition of the objects, untouched for the last 350 years, offers a unique opportunity to investigate the collection of high-status objects.

This presentation focuses on one interesting object in particular: an oval, gilded and decorated brass box, resembling a powder box. To date, no exact historical parallels have been located. Objects belonging to a toilet service were found in this wreck, made of wood and textile, like a mirror and a comb in a purse. This early 17th century set appears to be incomplete, yet complementary objects made from metal have been found, among which the box that is the subject of this study. Around 1650, toilet services entirely made in (precious) metal became fashion. There must have been a period where both types have coexisted and where hybrid forms were in use. However, these composite sets have never survived the passage of time, especially due to splitting up at inheritances. The unique context of the metal box provides an excellent opportunity to incorporate historical written sources, iconography, museum collections and information from contemporary paintings into the art-technical material research.

8 **ARCHAEOLOGY IN THE VIRTUAL RECONSTRUCTION OF XVIII CENTURY CHINESE BRIDGE IN ROYAL ŁAZIENKI MUSEUM PARK IN WARSAW, POLAND**

**Author(s):** Solecki, Rafal (Cardinal Stefan Wyszyński University in Warsaw) - Gołębniak, Andrzej - Żyła, Iwona (Archaeological Company INCED03D) - Jaskuła, Andrzej (Pracownia Archeologiczno-Konserwatorska Natfarri)

**Format:** Oral

Chinese Alley is the main route of Royal Łazienki Museum Park in Warsaw, Poland. It was called so in XVIII century, as a reflection of Chinoiserie style popularity. At that time the way was decorated with Chinese stylised gazebos, pergolas and bridges. During XIX and XX century the original character of that place has vanished and almost no traces of small garden architecture elements survived



to the beginning of XXI century.

In 2012-2014 the revitalisation of the route was undertaken and archaeological excavations was a part of that project. During archaeological fieldwork remains of the Chinese Bridge - the main element of the Chinese Alley - were discovered. The Chinese Bridge was known from many original XVIII and early XIX century engravings and plans. The reconstruction of that structure was not in the schedule of the project and it was only figuratively marked at the ground level. Fortunately, on the basis of archaeological excavations and available original sources, the virtual reconstruction of the Chinese Bridge was done.

9 “THE HEARTS OF HUMANS CHANGE ABSOLUTELY NOT, THROUGH ALL TIMES.” – OR? THEORETICAL AND INTERPRETATIVE PROBLEMS OF PARADIGM-CONFLICS IN INTER-DISCIPLINARITY

**Author(s):** Lindstrom, Torill Christine (SapienCE, Centre for Early Sapiens Behaviour, CoE, Faculty of Humanities, University of Bergen; Department of Psychosocial Science, Faculty of Psychology, University of Bergen)

**Format:** Oral

The quote from Sigrid Undset (Nobel-prize in literature) alludes to the idea of something common human that persists through “all times”, despite the changes of technologies, societies, belief-systems, and ways of thinking. This is also an underlying axiom in evolutionary psychology, connected to the concept of “human nature”: that certain aspects are typical of our species, and found in practically all societies and at all times. – As the concept of “human nature” is associated with and based on “hard sciences”, the “soft sciences” i.e. humaniora, protest: both social-constructivism in psychology, and anthropology claim diversity and differences as being typical for humans. These are conflicting paradigms. What the sciences call essential, the humanities call trivial. – How then can this gap be bridged within archaeology? How can we combine and merge ideas about human nature with ideas of diversity when making inferences about Palaeolithic lived lives and behaviours? These problems connect to philosophy of science, epistemology, and to the present Zeitgeist of inter-/trans-disciplinary research. – In this presentation, I will illustrate these problems with examples of interpretations of artefacts (shell-beads, bifacial flint-points, and engraved ochre) from South African MSA, with regard to (possible) social behaviours, and development of brain and cognition. Although these examples are from (our common past) in Palaeolithic Africa, they still bear relevance to interpretation of findings from European Paleolithic.

I will demonstrate how one can be lead astray in interpreting Paleolithic artefacts and behaviours by using comparative analogies and notions about typical human behaviour too superficially, while underestimating deeper human motivation; and on the other hand, how insistence of idiosyncratic diversity can hamper interpretation, theory-building, as well as collaboration. – Finally, as solutions, the inter-disciplinary biosocial obviation approach (Ingold 2001), triangulation between quantitative and qualitative methodologies, and not only inter-, but trans-disciplinarity will be advocated.

10 THE CONVOLUTED, THE COMPLICATED, THE COMPLEX, AND THE CHAOTIC: A TALE OF ARCHAEOLOGICAL CONFUSION, LOVE, AND HORROR

**Author(s):** Zubrow, Ezra (Universities of Toronto and Buffalo) - Lindstrøm, Torill (University of Bergen)

**Format:** Oral

Spatial complexity is both a psychological and a geographic phenomena. In this paper we examine the differences among the “convoluted,” the “complicated,” the “complex” and the “chaotic.” First, we provide definitions and second, we give examples from the archaeological record. Third, we do an “ethnographic” analysis of archaeologists. The authors’ show colleagues different archaeological spatial landscapes and asking them to classify them into simple, convoluted, complicated complex, and chaotic using standard psychological testing procedures. Next, we classify their answers and see if there is any relationship to the formal definitions and are there other patterns in either the archaeologists or the landscapes that they are analyzing. Finally, we ask how one does actually measure spatial complexity with spatial statistics and examine the landscapes that have been used in the survey and show which are actually in which category. It is a prolegomenon to the actual use of spatial complexity in archaeology.

11 WHAT KIND OF STORIES CAN YOUR BUG TELL ME?

**Author(s):** Hodecek, Jiri (SHIFT)

**Format:** Oral

Insects are the most abundant group of organisms. They colonise all trophic niches including dead bodies or storages of human food. The knowledge of the biology of necrophagous or other synanthropic species is used in forensic entomology for centuries. However, since insects’ chitinous exoskeleton is usually well preserved, this knowledge is newly used also to uncover previously undetected information in many recent archaeological studies. This relatively new discipline is called archeoentomology and the extent of its potential can be game changing.

From medieval blessed priest to the ancient pyramids, insects can tell us stories about the deceased and the time they lived in. Indeed, the methodology for collecting, handling and analysing insect remains and their traces can be directly derived from forensic entomology. However, the fields differ due to their different aims. The main aim of archeoentomology is the reconstruction of past environments, but it can also contribute to the history of stored grain pests and to the archaeology of funerary practises. A review of current archeoentomological cases as well as the methodology and terminology will be presented.

515 GENERAL SESSION - KURGANS IN SOUTHEAST AND EAST-CENTRAL EUROPE

**Theme:** 6. Embedded in European archaeology: the Carpathian Basin

**Chair:** Włodarczak, Piotr (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

**Format:** Regular session

ABSTRACTS

1 RITUAL OF TUMULI BURIAL IN THE TERRITORY OF KOSOVO DURING THE BRONZE AGE

**Author(s):** Baraliu, Sedat (Faculty of Philosophy) - Alaj, Premtim (Archaeological Institute of Kosovo)

**Format:** Oral

This paper gives an insight on Bronze Age burial rites, an epoch little known in Kosovo due to the lack of sufficient archaeological excavations. Both tumuli and flat graves are taken into consideration. Although the existence of a large number of tumuli has been documented, most of them have not yet been excavated. Of the 210 tumuli identified so far in the territory of Kosovo, only 60 have been excavated; of which only 6 belong to the Bronze Age. Based on the results to date, it appears that tumuli are scarce at the beginning of the Bronze Age, but during the Middle Bronze and Late Bronze Age burial rites have increased significantly to reach a widespread and diffuse distribution during the Iron Age, thus becoming the main burial rite and a characteristic feature of all the Western Balkan regions. This paper will deal only with the tumuli necropolises of the Bronze Age, but not excluding the flat graves of this period that are connected with the urn field phenomenon well known in all Europe . A local characteristic of this burial rite is its extension to only a part of the territory of Kosovo, which poses the problem of the border between Balkans and Greece as concerns the spread of urn field southwards.

2 GEOARCHAEOLOGICAL ANALYSES OF THE CSÁSZÁRNÉ-HALOM (MOUND) AT PUSZTASZER

**Author(s):** Cseh, Péter - Molnár, Dávid - Makó, László (Department of Geology and Paleontology, University of Szeged) - Sümegi, Pál (Department of Geology and Paleontology, University of Szeged; Hungarian Academy of Sciences, Institute of Archaeology)

**Format:** Oral

The aim of our study is the geoarchaeological examination of the Császárné-halom at Pusztaszer, which is an anthropogenic positive exgeological form (mound/kurgan). This object is one of the famous “seven mounds” at the Pusztaszer area, and one of the kurgans in the Hungarian Great Plain, whose construction is most likely connected to the Yamnaya Culture at the Late Copper and Early Bronze Age. The complex geoarchaeological investigation of the mound allowed us to separate the different layers in the human-constructed body of the kurgan and the buried soil level below. For this purpose, we used sedimentological analyses including one of the most important parts of geoarchaeological investigations, the magnetic susceptibility measurements of samples extracted from borehole deepened into the mound body. This data can be used to separate the construction layers of the mound, as well as the possible former soil surfaces. The magnetic susceptibility data set is also suitable for the comparison with other mounds to support our results. Based on the results of our research, the changes in the sediment and soil levels and the local environment of the mound over the past ca. 5000 years can be reconstructed.

3 BUILDERS – REBUILDERS. UNIVERSAL FUNERAL BEHAVIOR OF YAMNAYA PEOPLE IN REGIONS OF EUROPE

**Author(s):** Włodarczak, Piotr (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

**Format:** Oral

Yamnaya communities are known as builders of many kurgan cemeteries. In fact, they often used the tombs of the older Eneolithic communities. At that time, dimensions of older mounds were enlarged and made more similar to the pattern of the new era (Early Bronze Age). These two ways of organizing cemeteries are found both in the North Pontic zone and in the areas of the Danube-Tisza expansion of the Yamnaya community. The starting point for these considerations are the investigations of mounds from the Vojvodina area. Then, the data obtained there will be compared with the results obtained for neighboring areas, as well as for the North-Western Black Sea region. An important factor in the comparisons made is the relation of Yamnaya cemeteries to specific manifestations of the Eneolithic tradition. An amazing fact is the repetition of behaviors recorded in particular regions. Another problem being considered is the possible differentiation of the Yamnaya communities erecting specific types of cemeteries.

4 BARROWS IN BULGARIA. NUMBERS, PROBLEMS, LEGISLATION, PROTECTION ACTIVITIES

**Author(s):** Alexandrov, Stefan (National Archaeological Institute with Museum - Bulgarian Academy of Sciences)

**Format:** Oral

Barrows are a constant part of the Bulgarian landscape. Although in the “Archaeological map of Bulgaria” digital information system there are more than 12 000 registered barrows, their estimated number in Bulgarian lands is more than 50 000. The earliest barrows date back to the 4th millennium BC, their number increasing during the 3rd and, especially during the 1st millen-

nium BC with its huge “Thracian barrows”. The latest barrows have been piled during the Late Roman Empire period and, occasionally in the 7th-8th century AD. However, they were still in use in the Medieval times when, in their upper fills Christian and Muslim graves, sometimes forming big necropolises had been dug.

Bulgarian barrows today are protected by the “Cultural Heritage Law” but most of them are damaged/destroyed by: 1) Treasure hunters’ activities; 2) Modern agriculture activities; 3) Big infrastructure projects. The problems related to barrows’ chronological and geographical patterns, their investigation and protection will be discussed in the presentation.

5 **BURIAL MOUNDS IN YAMBOL DISTRICT, BULGARIA**

**Author(s):** Valchev, Todor (Regional historical museum - Yambol)

**Format:** Oral

The Yambol district is situated in South-east Bulgaria, on the border with Turkey, and is comprised of four municipalities with total area 3 335.5 sq. km. This area includes some 2,300 archaeological sites.

Burial mounds are earthen structures ranging from 0.5 to 5.0 m in height and up to 50 m diameter. They were built from the Early Bronze Age to the beginning of Late Antique period in connection with mortuary practices. Burial mounds are cultural monuments of national significance.

The aim of the present report is to examine the current condition of burial mounds in Yambol district. More than 1,200 such cultural monuments are known in this region. From the beginning of the 20th century 58 burial mounds have been excavated and provided interesting information about mortuary practice and believes of ancient people. In the last decade 850 burial mounds have been visited by local and foreign specialist during several field survey projects. All the visited sites have been registered with GPS points, photographed and their current condition was thoroughly described. Knowing the exact position of archaeological sites is very important for the protection of these cultural monuments, especially during different infrastructure projects.

The “Cultural Heritage Law” of Bulgaria states that burial mounds are carriers of “historical memory, national identity and have scientific or culture value”. They must be preserved for the next generations and for the prosperity of the community.

6 **EURASIAN BURIAL MOUNDS AS ENDANGERED HOTSPOTS FOR BIODIVERSITY CONSERVATION**

**Author(s):** Deák, Balázs (MTA-ÖK Lendület Seed Ecology Research Group)

**Format:** Oral

The Eurasian steppe is among the most endangered biomes of the world, especially in its western territories, where more than 90 % of their original stands have been destroyed due to conversion into croplands, afforestation and other human activities. In intensively used landscapes remaining patches of steppe vegetation is often restricted to places unsuitable for ploughing. Such places are the ancient burial mounds (so called kurgans) built by the Yamnaya culture often acting as refuges for steppe species. Based on a Eurasian wide literature review we estimated that the proportion of kurgans preserving steppe vegetation increases from west to east and from lowlands to uplands. We identified that currently the main factors threatening the biodiversity of kurgans are intensified agriculture and construction works. Based on floristic data from Hungary, Bulgaria and Kazakhstan we showed that despite their small size, kurgans act as biodiversity hotspots due to their (i) special dry habitat conditions, and (ii) the presence of a high level of topographic heterogeneity generating marked differences in environmental factors such as microclimate and soil properties. This pronounced fine-scale environmental heterogeneity allows the co-existence of a wide range of steppe and forest-steppe species even within a few tens of metres. We proved that due to their special attributes mounds acting as habitat islands embedded in agricultural fields can effectively maintain the fragments of the several millennia old wildlife typical to the ancient landscapes. Protection of steppic burial mounds is an important task of present days, as by their conservation we can preserve a piece of our historical and natural heritage.

a. **CULTURAL HERITAGE AND BIODIVERSITY CONSERVATION – RESTORATION OF STEPPE HABITATS ON ARCHAEOLOGICAL SITES FROM THE BRONZE AGE**

**Author(s):** Deák, Balázs - Valkó, Orsolya (MTA-ÖK Lendület Seed Ecology Research Group)

**Format:** Poster

Linking the conservation of cultural heritage and natural values provides a unique opportunity for preserving traditional landscapes and receives an increased awareness from stakeholders and society. Ancient burial mounds and earthen fortresses are proper objects of such projects as they are iconic landscape elements of the Eurasian steppes and often act as refugia for grassland specialist species. We present here case studies from the Hungarian Great Plains from the Hortobágy and Duna-Ipoly National Park Directorates. Our aim was to reintroduce grassland plant species to the archaeological sites for representing them as cultural monuments with the associated biodiversity for the public. The effectiveness of four methods were tested: hay transfer, seed sowing, transplanting greenhouse-grown plants and translocating individuals from threatened populations. Hay transfer proved to be the most feasible method for the introduction of steppe specialist plant species. It is crucial to use hay originating from a proper donor site, this way the seeds of a high number of target species can be introduced to the restored sites and the spread hay inhibits the germination of the weeds. In case there is no available hay material for the restoration, we recommend to use a combination of seed sowing and transplanting greenhouse-grown plants. Sowing was found to be a cost-effective method for introducing large-seed-

ed species, whilst introduction of greenhouse-grown transplants warranted higher establishment rates for a larger set of species. Transplanting or translocating adult individuals was more reliable regardless of post restoration management regimes, however this method is labour-intensive and expensive. We showed that introducing characteristic grassland species on cultural monuments offers a great opportunity to link issues of landscape and biodiversity conservation and the restoration of cultural ecosystem services.

516 **GENERAL SESSION - THE ROMAN LIMES AS MILITARY, POLITICAL, ECONOMIC AND CULTURAL DECISIVE FACTOR ON THE BARBARIAN TERRITORIES**

**Theme:** 2. From Limes to regions: the archaeology of borders, connections and roads

**Chair:** Bartus, Dávid (Eötvös Loránd University)

**Format:** Regular session

**ABSTRACTS**

1 **ROMAN-PROVINCIAL POTTERY AS AN INDICATOR OF CROSS-BORDER TRADE RELATIONS BETWEEN THE PANNONIAN BORDER ZONE AND THE NEIGHBOURING GERMANIC SETTLEMENT AREA**

**Author(s):** Sofka, Stanislav (Institute of Archaeology of the Czech Academy of Sciences, Brno; Department of Archaeology and Museology, Faculty of Arts, Masaryk University)

**Format:** Oral

Pottery, as most numerous category within the group of the import products, represents a relatively representative source of information for study of wide range of issues of Roman-barbaric relations during the Roman Period in the Middle Danube region. Therefore, its systematic registration, which is the subject of the ongoing project CRFB in the region of Moravia, significantly enriches the possibilities and potential of future research activities and intentions. On basis of material processing from this region, presently it appears that the main interest of the Germanic population has been in the specific shapes of containers, particularly jugs and ring bowls. Given the amount of material and its distribution within the settlement, it can be assumed that it was evenly distributed from central settlements to other smaller units of the settlement structure. The collection of Roman-provincial pottery from Moravia and its comparison with other types of imported goods, as well as with neighbouring regions, could mediate further insights into important questions about trade and distribution during the Roman Period.

2 **FROM THE LEGIONARY CAMP TO THE PROVINCIAL CITY: ECONOMIC TRANSFORMATIONS IN NOVAE (MOESIA SECUNDA) IN THE LATE ANTIQUITY**

**Author(s):** Klenina, Elena (Adam Mickiewicz University, Poznan)

**Format:** Oral

The Roman legionary camp Novae, one of the most important strongholds on the border of the Empire has been among the most well studied objects of this type in the area of the Lower Danube. Studies carried out in the course of previous science and research projects related to uncovering the large legionary baths and the bishopric complex in Novae led to the discovery of a monumental arsenal. At the next stage, the arsenal was rebuilt into horreum. The intensification of construction activities in this region was likely associated with the rise to power of Emperor Constantius II (337– 361), in Constantinople. Similar types of horrea appeared in the first half of the 4th century in Capidava, Histria (Scythia), Serdica (Dacia Mediterranea), Kovachevo Kale (Moesia Secunda). The horreum in Novae, in terms of its architecture and size, is similar to the building uncovered in Capidava (Scythia). The walls were 1.50 m wide, like those in Novae. The other horrea mentioned above were much smaller. The design features of these structures indicated that they were intended for storing goods transported in amphorae rather than grain. The emergence of structures of this type in the Roman military fortresses was caused by their new functions, for example, the commercial one.

3 **THE EARLIEST FRONTIER OF THE FUTURE DACIA**

**Author(s):** Marcu, Felix (The National History Museum of Transylvania) - Szabó, Máté (Clir Research Center, Pécs)

**Format:** Oral

The structure of the “classical” limes in modern Romania consisted of a complex system of towers, earthworks, walls, small fortifications, the forts behind the limes being usually placed at a distance of ca. 5 km from it, the related civil settlements and non-Roman structures.

Of a special importance are the temporary camps in Orăștie Mountains, one of the values being their earliest chronology, dating from the very beginning of the Roman conquest of Dacia. They reveal in a very special way the Roman army strategy in one of the most important conflicts of the Roman Empire, being probably dated to the first Dacian War (101-102 p.Chr.), like the other earthworks from vicinity belonging to the conflict scene, built by the Romans or by the Dacians in order to win the war. Consequently, after the first Dacian war until the 2nd Dacian war (105-106 p.Chr.) and the creation of the new province of Dacia the limes is to be found on the line of the most advanced Roman installations, which are in Orăștie Mountains, the most important being the former Dacian

a.

capital, Grădiștea Muncelului (Sarmizegetusa).

### FUNERARY STELAI OF ITALIC LEGIONARIES IN AQUINCUM

**Author(s):** Puppo, Paola (MIUR - Ministero dell'Istruzione, dell'Università e della Ricerca)

**Format:** Poster

About the development of Roman Settlements the question of the Italic legionaries is interesting: they died in the battlefield far from their place of origin and therefore left in testament the request to built a funerary stele that could perpetrate their memory to posterity. The inscriptions show the main elements of the deceased (personal name, father's name, place of origin) and of the legion of belonging, the age of death and the years of military service. Sometimes it is indicated who took care of his burial and his funerary monument (he can be the commander of the legion, a companion in arms, his friend and heir of his goods). On the stele is depicted the type of the standing military, with lance in the raised right hand, round or oval shield, sometimes decorated (for example with a Medusa head in relief as in the stele of Castricius Victor, from Como, of the legion Adiutrix that died in Pannonia in the first quarter of the 2nd century AD, found in Aquincum).

In the Archeological Museum of Aquincum (inv. 63.10.64), is preserved the funerary stele, found in 1962 in Bècsi út of Budapest, dated to the second half of the 2nd century AD, of Lucius Varius Pudente, a legionary from Parma, as documented by the inscription. The Legio X Gemina under Trajan was transferred from Germania Inferior to Pannonia Superior, in Aquincum and here the veteran Lucius Varius Pudente died in his sixties.

The degree of refinement, the stone used, constitute variables determining the price of the monument, which could be declared in the inscription as a pride if the work was of high quality and preciousness. These monuments document the existence of young Romans forced to leave their homeland for work and to find the death in a foreign land.

b.

### SACIDAVA AND ITS ROLE OF MILITARY OUTPOST IN THE MOESIAN SECTOR OF THE DANUBE LIMES

**Author(s):** Mototolea, Aurel - Potârniche, Tiberiu - Colesniuc, Sorin (Museum of National History and Archaeology Constanța) - Stanc, Margareta (Faculty of Biology, Alexandru Ioan Cuza University of Iași)

**Format:** Poster

Sacidava archeological site is located in Dobruja region, Romania, on a hill on the right bank of the Danube - the Musait point, located at about 5 km north-east from Dunăreni village.

The place-name documents the fact that, prior to the Roman conquest, in the area there was a Getic settlement. The location of the Sacidava was made possible by corroborating the data provided by the ancient sources with the epigraphic documents (the milial pillar during the time of Emperor Decius). The tegular findings attest that an infantry unit, cohorts I Cilicum milliaria equitata, as well as detachments from Legio V Macedonica and Legio XI Claudia were confined to Sacidava. During the period of the Dominion, the garrison of the fortification is the host of a cavalry unit: cuneus equitum scutariorum.

In the immediate vicinity to the Roman fortress, to the east, were identified two other fortifications: a Getic settlement (4th - 1st century B.C.) and an Early Medieval settlement (9th - 10th century A.C.).

The archaeological material recovered during the research is represented by ceramic forms such as amphoras, jugs, pots, cups, plates, to which are added oil lamps, some of them typologically new at the time of discovery. Local ceramic shapes were also founded, worked by hand or by wheel, considered un-Romanized or in the course of Romanization.

During the time of the Principality, Sacidava it represented an important military outpost serving mainly the city of Tropaeum Traiani, controlling also the supply and transport on the Danube limes in the Moesic sector. This role will determine the development of the fortress and the appearance of extramuros civil structures, thus becoming an important landmark during the 5th - 6th centuries A.C., becoming a representation of power of the Roman empire in an area of continuous conflict.

c.

### CORSE: TOWARDS AND BEYOND THE 3RD CENTURY AD. A POSSIBLE TURNING POINT WITHIN ROMAN SETTLEMENTS DYNAMICS?

**Author(s):** Piccardi, Eliana (Independent researcher)

**Format:** Poster

This summary focuses upon the Corsica island reality, set between continental coastlines, hence apparently untouched by Northern limes issues and less involved in the North-African Barbaricum one, within the chronological frame which finds out its breaking point through the 3rd century AD: as far as the coming next to this century and the going beyond it, will draw or not a kind of 'shadow-line' on the island, especially about the dwelling dynamics and the related economic aspects? The insularity won't wholly preserve this territory from the dynamics which after the 3rd century AD were to involve the Roman Empire and the Western Mediterranean at the passage from the Mid to the Late Antiquity.

Starting by the very few ancient sources, and by gathering scattered archaeological evidences, we realize that the frame of the witnesses from the island is nowadays enriching, although remaining spotted and marked by not homogeneous evidence; in spite of this, also for this period interesting clues are emerging from recent researches, while some others are waited for coming out from future perspectives.

A summary of the archaeological evidence of the island, deliberately assuming the 3rd century as a focus and as an eventual 'turning point', may offer the chance to enlighten a human and cultural landscape in its different dynamics. Face the scarcity of the sources about the centuries afterwards for the Northern Tyrrhenian Sea is Rutilius Namatianus's work which may offer a pattern of coastal inhabiting sites, comparing his remarks – beyond the poetical frame – to the Corsica coastal sceneries as well as their morphology, the places-conditionings with the former heritage and their evidence appear. Under the 'sign' of continuity or discontinuity the collected issues punt anyway the isle in the wider process throughout the Late Antiquity, the Early Christianity and towards the Middle Age.

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### GENERAL SESSION - “MORE THAN JUST BONES” - UNDERSTANDING PAST HUMAN BEHAVIOUR THROUGH THE STUDY OF HUMAN REMAINS

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Chair:** Szeverenyi, Vajk (Déri Múzeum, Debrecen; Institute of Archaeology, Research Centre for the Humanities, Budapest; Institute of Archaeological Sciences, Eötvös Loránd University, Budapest)

**Format:** Regular session

1

### INFANTS VS SOCIETY: HUMAN AND FAUNAL REAMAINS DOCUMENTING UNUSUAL BURIAL RITUALS

**Author(s):** Pansini, Antonella (Sapienza University of Rome; Italian Archeological School at Athens) - Migliorati, Luisa - Sgrulloni, Tiziana (Sapienza University of Rome) - Fiore, Ivana - Sperduti, Alessandra (Museo delle Civiltà - Rome)

**Format:** Oral

The archeological site of Peltuinum Roman city is located in the Apennines of central Italy, near L'Aquila (Abruzzi region): here the excavations of the Roman theatre, conducted by "Sapienza University of Rome", have highlighted a very interesting and unusual case of burial. Indeed, in the shafts at the foot of the stage frontage connected to the working system of the curtain, hundreds of bones attributed to fetuses and newborns of humans and dogs of different ages (adults, puppies and fetuses) were found. They were also associated with other faunal remains, relating to whole foals and selected parts of different animals.

Archaeological data suggest the depositions took place over fifty years after a violent earthquake destroyed the theatre in mid 5th century AD.

The analysis of the bones, carried out in collaboration with Department of Bioarcheology of the "Museo delle Civiltà" in Rome and Department of Environmental, Biological and Pharmaceutical Sciences and Technologies of "Luigi Vanvitelli" Campania University, has made it possible to understand the deposition dynamic and to interpret the context. As known, in the ancient world the dog was connected to the passage between life and death and was linked to the purification rituals. The presence of traces of blows on some dog's skulls found at Peltuinum confirms the hypothesis that the animals were sacrificed for ritual purposes related to the death of infants who were not yet integrated into society.

The importance of the discovery is to be underlined not only for the state of conservation of the remains, the number of individuals and the singularity of the place of deposition; the unusual burial is the result of official Society behaviour towards infants, whose testimonies have been found over the centuries.

2

### SACRIFICE, (RE)BURIAL, AND THE FRAGMENTATION OF BODIES: HUMAN REMAINS FROM EARLY AND MIDDLE BRONZE AGE SETTLEMENTS IN THE CARPATHIAN BASIN

**Author(s):** Szeverenyi, Vajk (Déri Múzeum, Debrecen; Institute of Archaeology, Research Centre for the Humanities, Budapest; Institute of Archaeological Sciences, Eötvös Loránd University, Budapest)

**Format:** Oral

The aim of the present paper is to investigate the phenomenon of human remains in various forms at settlements of the Early and Middle Bronze Age in the Carpathian Basin, especially in Hungary. During the past two decades, mainly thanks to large-scale preventive excavations, our database of such remains has increased considerably, which sheds new light on previously excavated assemblages as well. In my presentation, I would like to examine if some kind of pattern can be observed in the deposition of human remains in these settlements. It can be established from the start that human remains entered the archaeological record through a number of different processes, in many different forms, and at various stages of decomposition and fragmentation. My main questions include, what kind of social and ritual practices can be reconstructed through the analysis of these remains? What might be their relationship to "normative" burial rites? In the case of identifiable human sacrifices, how can we conceptualize the role of such rites with regard to the religion and identity of the participants?



3 A QUANTITATIVE STUDY OF LINEAR POTTERY CULTURE CEMETERIES

**Author(s):** Hahnekamp, Yanik (Institut für Urgeschichte und Historische Archäologie, Wien)

**Format:** Oral

From about 5700 to 4900 BC, the Linear Pottery culture – the earliest archaeological horizon of the Middle European Neolithic – spreads across and beyond Central Europe, reaching the Paris Basin westwards the Rhine and even the eastern Ukraine in the process. Although it represents one of the most extensively researched Neolithic cultures, many questions about Linear Pottery cultural beliefs and social identities remain highly discussed. An important role for exploring these factors are funerary rites, with approximately 80 cemeteries offering at least 3000 burials to study.

Attempts to quantify such extensive amounts of data have been rare so far. Reasons for this might be found in its large-scale distribution; as its archaeological evidence is scattered across a wide area, to grasp and analyse all graveyards is time-consuming and difficult, especially for individual archaeologists. This issue is not merely bound to the Linear Pottery culture, but to any larger cultural complex or era. Modern technology has helped scientists to develop powerful tools which not only provide solutions to these problems, but new opportunities as well.

This presentation will cover the methods and results of a quantitative study of Linear Pottery cemeteries. The goal was to find regional and individual patterns in Early Neolithic funerary practices to discover specific social and cultural peculiarities. For this purpose, different analytical approaches have been used: Seriation, correspondence analysis and the newly developed “Analysis N Next Neighbours”. The subjects of these analyses were grave goods, anthropological or physical characteristics (e.g. age, sex, positioning) and other traits and features (grave pit orientation, burial type, condition etc.). These tasks have been carried out by using the software WinSerion, which demonstrates that by using the right tools, it is possible even for individual archaeologists to analyse large amounts of data on their own.

5 PXRF ANALYSES OF GRAVES INFILLS AND CEMETERY SOILS IN MEDIEVAL MINING TOWN

**Author(s):** Horak, Jan - Šmejda, Ladislav - Hejcman, Michal (Czech Univ. of Life Sciences, Dept of Ecology)

**Format:** Oral

The presentation introduces the results of PXRF multi-elemental analyses of cemetery sediments and necrosols performed during the rescue excavation of cemetery of the All Saint`s chapel in Sedlec near Kutná Hora (central Bohemia; chapel with famous ossuary). The presentation expands the preliminary results presented in EAA 2017 (results of sampling from years 2016 and 2017) by sampling from seasons 2018 and 2019. The sampling of cemetery sediments covered all stratigraphy from loess sediments, pre-historic layers, pre-mining and pre-cemetery medieval layers, medieval graves, mass graves (mainly famine and plague), post-mining late medieval graves and modern era layers. The grave infills and necrosols were sampled with respect to distinguish between infill itself and the soil / necrosol / sediment in space where body was decomposed (although such approach was not possible in all cases due to the density of bodies in some areas of cemetery). We also sampled all main parts of the bodies (head, body, arms, legs, all in many points). The analysis has brought interesting results not only for main regional contaminants (As, Cu, Zn, Pb).

We are thankful for the funding provided by the project DEEPDEAD: Artefacts and human bodies in socio-cultural transformations (HERA Joint Research Programme, grant HERA.15.055). The authors activities in this project were also supported by project “Geochemical insight into non-destructive archaeological research” (LTC19016) of subprogram INTER-COST (LTC19) of program INTER-EXCELLENCE by Ministry of Education of Czech republic.

6 SCULPTURAL FACE RECONSTRUCTION OF BÉLA, DUKE OF MACSÓ (12TH CENTURY AD)

**Author(s):** Kustar, Agnes (Hungarian Natural History Museum) - Baliko, Andras (Szentendre)

**Format:** Oral

Béla, Duke of Macsó was murdered in November 1272 on the Island of the Rabbits (now Margaret Island). At the royal court, Baron Henry Kőszegi accused the duke of betrayal and brutally kidnapped him by drawing a sword. Pieces of her body were collected by his sister and the other nuns in the courtyard of the monastery. His earthly remains were buried in the monastery of the Island. As there is no contemporary depiction of the Duke, scientific face reconstruction is the only way to get to know his features.

A CT image was taken first of the original skull, which was used to make a plastic copy of the skull by 3D printing. During the facial reconstruction, the soft parts of the face were rebuilt on the plastic skull to reflect faithfully the sometime facial features, based on the shape of the bones. Facial reconstruction was performed using a traditional sculptural anatomical method following scientific methodological guidelines (GERASIMOV 1949, 1971, TAYLOR 2001, PRAG & NEAVE 1997). Muscle thickness was estimated from bone surface roughness using a table from scientific data at 45 measurement points of the skull (RÖHRER-ERTL & HELMER 1984).

Duke Béla’s skull was masculine, but not very robust. The main features were the very short and broad skull with rounded occiput. The facial skeleton and the nasal cavity were very tall and narrow. The features of the reconstructed face follow the character of the skull. The face of the young Béla is masculine despite his youth. Since the original hair is unknown, the reconstructed hair is based on 13th-century carvings and wall paintings of the Ják Abbey Church.

This research was supported by The House of Árpád Programme (2018–2023) Scientific Subproject: V.1. Anthropological-Genetic portrayal of Hungarians in the Arpadian Age.

a. APPLYING ARTIFICIAL INTELLIGENCE IN SKULL CLUSTERING

**Author(s):** Kustar, Agnes - Evinger, Sandor (Hungarian Natural History Museum) - Nemeth, Endre - Kesmarki, Gergely (ABC Consulting, Budapest)

**Format:** Poster

The aim of our research is to develop artificial intelligence based software that can be used to train skulls classification by biologically relevant information. The use of skull clustering software greatly facilitates the work of anthropologists in estimating biological relationship of different historical populations.

The software consists of two parts. From a web-based application (FaceNet) that creates vectors and distance matrices from photographs, and from a Python application (PyCharm) that helps the visualisation of biological relationship among the objects through different clustering and ordination methods.

FaceNet’s algorithm is currently one of the best known face recognition algorithms. Because of the rich mathematical and IT tools available for analyzing point sets in 128-dimensional space, it is also a suitable candidate for the scientific analysis of faces and skulls.

While “traditional” software is based on formal descriptions, mathematical rules, and pre-designed algorithms - so-called specifications - software based on artificial intelligence, including machine learning, is able to recognize rules independently or with human help, or to determine rules. Recognizing regularity is the end result of a learning process that results in the system getting better and better at the given patterns. The Pilot study analyzed face and skull test data from several databases by gender, age, and anthropological type. The results obtained for faces were interpretable already in the first phase. The application of artificial intelligence is a pioneer in the methodology of historical anthropology, but its potential goes far beyond the field of anthropological research.

This research was supported by The House of Árpád Programme (2018–2023) Scientific Subproject: V.1. Anthropological-Genetic portrayal of Hungarians in the Arpadian Age.

b. FACIAL RECONSTRUCTION ON THE SKULL (“GERASIMOV METHOD”) IN RUSSIA: BACKGROUND AND MODERNITY

**Author(s):** Nechvaloda, Aleksey (Ufa Research Center of the Russian Academy of Sciences)

**Format:** Poster

Mikhail Mikhailovich Gerasimov (907-1970) - founder of the method of facial reconstruction based on the human skull in Russia. The main provisions of his method are published in two monographs: “the Basics of facial reconstruction from the skull”, 1949, and a well-known work in the West- “facial Reconstruction from the skull (ancient and modern man), 1955”). The method he proposed was recognized in the Anglo-Saxon world as the “Russian method”, along with the “American” and “British” (“Manchester” method). In the English-language literature on facial reconstruction for forensic purposes, there is an unfounded view that Mikhail Gerasimov did not use information about the thickness of the soft tissues of the face and does not rely on modeling the “muscle skeleton” of the human face. This is the result of an incorrect reading of Mikhail Gerasimov’s texts. The Gerasimov method in Russia continues to develop and enrich itself with new approaches and has its followers abroad. Approaches have been developed to determine the degree of protrusion of the eyeball from the orbit. Work is underway to predict the presence of the “Mongolian fold” based on the morphological features of the orbit structure. The “Gerasimov method” is used in forensic science as a graphic reconstruction of the face from the skull.

c. TREPHINATION ONLY FOR THE PRIVILEGED? CASE STUDIES FROM THE IRON AGE LATVIA (7TH-10TH C AD)

**Author(s):** Erkske, Aija - Vilcāne, Antonija - Pētersone - Gordina, Elīna - Gerhards, Guntis (Institute of Latvian History at the University of Latvia)

**Format:** Poster

Evidence of trephination has been found in archaeological material from Latvia dating from the Neolithic up to the 18th century AD. This study focuses on five probable cases of trephination from three burial grounds dating from the 7th – 10th century AD. All five trephinations have been performed on men aged between 30 and 50 years at death and are most probably attempts to heal cranial injuries. The trephinations in question have been performed by scraping and were successful in most cases. The complexity of these operations might be the reason why the few cases found in skeletal material from the Iron Age in Latvia seem to be closely related to high social status. In this respect, skeletal material from the Lejasbitēni burial ground is especially intriguing. Forty-two adult skulls were available for study, and in two of them, there was evidence for trephination. A male aged 30-35 years at death had trephination measuring 32 x 37cm at lambda; the operation was performed after a head injury, to clean the wound from fractured skull fragments. According to grave goods, including a very robust warriors’ armband, a double-edged sword and a socketed spearhead, this man was of considerable wealth, and lived and died in the 10th century AD. However, his position in the society is questionable, because his burial was on the periphery of the burial ground, away from other burials. It is possible that the burial location was defined either by this individual’s social status during his life, or the cause of his death, or maybe both.

The results of this study have provided new information with regard to the possible relationship between trephination and social

status in Iron Age societies in the territory of Latvia.

This research was a part of the Latvian Council of Science project No lzp-2018/1-0395.

d. **DEATH, BURIAL AND HUMAN OSTEOLOGICAL REMAINS AT THE ROMAN COLONY OF DION: NEW INSIGHTS FROM THE NORTHERN AND WESTERN NECROPOLIS**

**Author(s):** Tritsaroli, Paraskevi (University of Groningen) - Alvanou, Evangelia (Hellenic Ministry of Culture and Sports)

**Format:** Poster

In recent years, Roman archaeology in Greece has begun to benefit from bioarchaeological analyses. The integration of human osteological remains with archaeological evidence has helped provide novel knowledge on the human past, by tracing the manner of life and death of people, particularly at major political and cultural transitions, namely from the Hellenistic times to Roman domination and later on to the acceptance of Christianity. Within this frame, our project examines the different ways identities of all social classes are negotiated under Roman colonization. To achieve this aim, we conduct a contextual analysis of the burials from the necropolis of Dion, the Macedonians’ religious center and federal shrine from the 5th c. BC onward. In 169 BC the city fell to the Romans and in 32/31 BC Dion became a Roman colony. Funerary evidence includes 200 graves dated to the Hellenistic and mainly to the Roman era, with few exceptions from the Classical and Early Christian periods. The majority were tile covered graves, followed by cists, simple pits and very few jar burials. Single inhumations largely outnumber cremations and multiple burials, suggesting that in Roman Dion to be buried alone was the rule as well as that the population adopted local rather than Italian burial practices. Although the quality and quantity of offerings for several burials signal considerable disposal of wealth, it would be misleading to assume that people buried with few or no possessions were poor or that they lacked status. Preliminary bioarcheological results show that despite the anonymity of the deceased, this assemblage of burials preserves vivid evidence of the osteobiographies of the people of Dion and the ways they were buried and commemorated for over four centuries. The excavation was conducted under the auspices of the Hellenic Ministry of Culture in 2013-2015. Funding information: H2020-MSCA-IF-2018, Proposal: 841096-BODICON.

e. **ENTHESEAL CHANGES AND THE CONFOUNDING EFFECTS OF SEX, AGE AND BODY SIZE ON ACTIVITY INTERPRETATION: ANALYSES OF MEDIEVAL EXETER**

**Author(s):** Ki, Sabrina (University of Exeter; Durham University) - McKenzie, Catriona (University of Exeter)

**Format:** Poster

Entheses are attachment sites for muscles, ligaments and tendons into the bone, and can be divided into fibrous and fibrocartilaginous entheses. Entheseal changes (ECs) have previously been used as markers of past activity (e.g. Hawkes and Wells, 1975; Merbs, 1983), as well as more recently (e.g. Karakostis et al., 2017; Refai, 2019); however, the validity of behavioural interpretations has been contested due to the multi-factorial aetiology of ECs. I investigated the extent to which ECs at fibrocartilaginous entheses (predominantly located near the epiphyses of long bones) correlate with changes in age, sex and body size, as these are common confounding factors referred to in the literature. Changes were scored on entheses from the upper limb and pectoral girdle, namely the M. subscapularis insertion, M. teres minor insertion, M. supraspinatus and infraspinatus insertions, common extensor and flexor origins, M. anconeus origin, M. biceps brachii insertion and origin (long head), M. brachioradialis insertion, M. triceps brachii insertion and origin (long head), M. brachialis insertion, and the clavicular attachments of the trapezoid, conoid and costoclavicular ligaments. The Coimbra method (Henderson et al., 2016) was used to score a medieval sample from Exeter. This poster presents the results of the first focused investigation into ECs in the medieval Exeter population. Contrary to the literature, there were no statistically significant differences found between mean EC score for different sex and age categories, and no statistically significant correlations were found between mean EC score and stature, nor between mean EC score and body mass. It is possible that an unmeasured variable (e.g. activity) was influencing the degree of covariance between the dependent variable (EC score) and independent variables. Expansion of the sample size, analyses of interaction between the independent variables and taking a repeated measures statistical approach are among the recommendations for further analyses.

**518 GENERAL SESSION - SEEING THE ‘ART’ IN ARTIFACTS: THE INTER-CONNECTIONS OF ARCHAEOLOGY AND THE ARTS**

**Theme:** 5. Theories and methods in archaeology: interactions between disciplines

**Chair:** Hueglin, Sophie (European Association of Archaeologists; Newcastle University; University of Basel)

**Format:** Regular session

**ABSTRACTS**

**1 THE RAVEN AND THE SEVERED HEAD IN THE OLD ENGLISH HEXATEUCH**

**Author(s):** Mattison, Alyxandra (Independent researcher)

**Format:** Oral

In 1975 Milton Gatch wrote an article entitled ‘Noah’s Raven in Genesis A and the Illustrated Old English Hexateuch’, in which he

explored the unusual position of the raven – perched on a severed head staked to the prow of the ark – in an Anglo-Saxon depiction of Noah’s ark floating in the flood waters in search of land. He compares the image to similar medieval manuscript illustrations of the same event, but in all others the raven sits on a bloated corpse floating near the ark. Gatch’s search for an explanation is unfulfilled and the article leaves us wondering about the oddity of this Anglo-Saxon raven.

The aim of this paper is to reconsider this image on folio 15r of the BL MS Cotton Claudius IV manuscript, and, in doing so, demonstrate that if Gatch had looked beyond the art historical discipline and explored this image within the greater context of contemporary Anglo-Saxon England, he would have realised that it is not the raven that is out of place in the image but the corpse.

Depicting the corpse of a sinner damned by God’s watery punishment as a severed head, displays an intimate understanding of Anglo-Saxon culture and religious ideals by the artist. Death by decapitation had a particular association with carnal sin and damnation for Christian Anglo-Saxons, which this paper will demonstrate using both archaeological and historical evidence. With an interdisciplinary approach, this manuscript image reveals a unique interpretation of a well-known biblical story intended to appeal to the specific judicial and spiritual fears of late Anglo-Saxon society.

**2 A MULTIDISCIPLINARY APPROACH TO ARCHAEOLOGICAL STUDIES: AN INVESTIGATION THROUGHOUT SILENT CINEMA**

**Author(s):** Marra, Patrizia (Independent researcher)

**Format:** Oral

Within the framework of our contemporary society accustomed to thinking in images, to which the role played by visual sources has become essential in the definition of knowledge and memories, cinema plays a core role, as a privileged receptor and popularizer of archaeological suggestions. Since the very first trial of the cinematographic medium, the attraction for the reproduction of settings and events of historical inspiration has been magnetic. Now that cinema has passed the age of a hundred years, it is time for a deeper reflection on the nature of its relationship with the ancient world.

The research presented here started by analysing a selection of silent cinema productions: early 20th century moviegoers have been imbued with realistic reconstructions, product of specifically conducted researches by the production teams. This first phase aimed at verifying the potentialities of meticulous crossed researches between archaeological and cinematographic data, by evaluating both the iconographic elements and the archival material. How can this give us a better understanding of the interrelations between archaeology, cinema and its public? A frame-by-frame analysis of film productions allows us to track the parallelism between archaeological realities and filmic reconstructions, often going hand to hand with didactic intents. Already in 1901, W.R. Booth’s trick-movie “The Haunted Curiosity Shop” conveys to its public a realistic image of a mummy; a few years later, Méliès, in his “Le monstre”, will contribute in the shaping of one of Egypt’s most iconic image: the Sphinx with pyramids and palms on the background. Better-known later productions such as Griffith’s “Intolerance” or Lubitsch’s “The Loves of Pharaoh” will reconstruct in detail scenes taken from Assyrian relief panels, as from Egyptian wall paintings. For the second phase of the research, an ongoing analytic study will point the focus on the connections between archaeology and Italian silent movies.

**3 PHENOMENOLOGICALLY EXPLORING ARCHAEOLOGICAL SITES USING CREATIVE ARTISTIC INTERPRETATIONS THAT DRAW UPON SOUND AND VR APPROACHES**

**Author(s):** Till, Rupert (University of Huddersfield)

**Format:** Oral

This presentation explores how sound, music, and acoustics can be used alongside VR and audio-visual technologies to explore archaeological sites. It examines a number of linked artistic expressions that provide phenomenological explorations of these monuments, while also providing information that informs archaeological analysis and interpretation. It also illustrates how such creative approaches can impactfully engage audiences and foster new understandings. Acoustic studies of Palaeolithic painted caves in Northern Spain, Stonehenge in the UK, and Paphos Hellenistic theatre in Cyprus, resulted in a range of sonic information that helps to understand how the sites would have been perceived by their users in the past. These results have been presented in a number of audio-visual works, including museum exhibits, apps, VR headset based presentations, six albums of music, film, and online resources, drawing upon a range of approaches and resources, such as laser scans, photogrammetry, experimental reconstruction, 3D graphical modelling, musical performance, onsite sound recording, acoustic modelling, convolution of impulse responses, electronic composition, and interactive design. Together these artistic interpretations offer new ways of experiencing these three world heritage sites.

**4 REVEALING ARCHITECTURAL IDEAS IN ARCHAEOLOGICAL HYPOTHESES**

**Author(s):** Lengyel, Dominik - Toulouse, Catherine (BTU Cottbus-Senftenberg)

**Format:** Oral

Archaeological hypotheses about architecture are mostly mediated verbally or by drawings or sketches. Both contain a variable uncertainties from finds over reasonable conclusions to conjectures based on analogies. Further more, spatial translations provide spatial experiences, mediated computer-generated by Virtual Reality. The common way is dominated by the games industry enriching hypotheses by a vast amount of fictitious content, usually called reconstruction, that create a supposedly contemporary im-

5 CREATIVE INTERVENTIONS AT THE EDGE OF THE TRENCH: THINKING, FEELING, AND DOING

Author(s): Hannis, Jodie (University of Leicester)

Format: Oral

The ways in which art practice and archaeology have always been entangled is relatively well-documented and now, as discourse turns a critical eye to notions of public engagement and impact, the ways in which creative archaeologies and community work come together is especially prevent. Practitioners know that these activities have value, but it's often difficult to evidence them while resisting an overly-quantified impact agenda. This paper will explore the author's preliminary findings from a series of creative archaeology interventions at the edge of the trench and situate them within the recent calls for a rigorous and reflective approach to artistic engagements. A combined discussion of the creative work of participants, research interviews, and the author's own (somewhat unexpected!) emerging creative writing practice, will aim to offer insight into the value of doing archaeology creatively and what possibilities this might open up for all involved. It is argued that offering creative activities on site can spark the interest of those who might not usually get involved and can provide a way to make meaningful interaction with archaeology possible for those often excluded from fieldwork. Such activities also provide a language for thinking and feeling about archaeology that might otherwise escape articulation in the day to day experiences in the trenches.

6 SZIGETVÁR: AN INTER-CONNECTED PHENOMENOLOGY OF PLACE

Author(s): Stevens, Fay (University of Notre Dame in England)

Format: Oral

In August 2019 I travelled to Szigetvár in Hungary as part of an ongoing collaboration between twinned cities of Bath (UK) and Kaposvár (Hungary). I was invited on an artist residency organised by Kaposvár Arts to create new work that responds to the heritage and archaeology of the castle of Szigetvár. This engagement with place is part on my ongoing process of exploration and research into the relationships between art and archaeology; as an archaeologist and as a practicing artist. Utilising archaeological technical drawing techniques, conceptual drawing practices and contextualising a phenomenological stance that is engaged with senses of place, I produced drawing work that engages with hegemonic memories and epistemologies of remembering. This work has so far been exhibited in two galleries in Hungary and is currently being articulated through presentations and publication. In this paper I consider how this work addresses issues of conflict archaeology, heritage and a cross-disciplinary, inter-connected engagement with the presentation of the past.

519 GENERAL SESSION - INTEGRATED MATERIALS: HOW CAN SIMPLE ARTEFACTS ANSWER COMPLICATED QUESTIONS

Theme: 1. Networks, networking, communication: archaeology of interactions

Chair: Potrebica, Hrvoje (University of Zagreb)

Format: Regular session

ABSTRACTS

1 DEATH METAL: RECREATING IRON AGE GRAVE GOODS

Author(s): Allen, Christopher - Stanton, Emily (University of Wisconsin-Milwaukee)

Format: Oral

The paper presents the results of an ongoing experimental archaeology project focused on recreating unique iron weapons and other objects from an Iron Age tumulus burial near the Heuneburg hillfort in southwest Germany dated to the 5th century BCE. The burial is unusual for the region and time period in both the types and style of grave goods found, which are more akin to Iron Age objects found in the Iberian Peninsula. This is evidence for interaction through various kinds of networks between Western and Central European cultures. Working with two blacksmiths we have recreated three sets of objects: a belt hook, a set of spears, and a sword. Through trial-and-error in the smithing process we have gained a better understanding of the technological solutions the craftworkers utilized to produce these items. At the same time the project demonstrates the potential of experimental archaeology to generate both scholastic understanding of the past and provide an interpretive connection to a fully formed object for the general public. The project demonstrates the pedagogical and museological potential of experimental archaeology as well as its contributions to the functional interpretation of items of personal adornment and weaponry in the past.

2 LEATHER FOOTWEAR RELICS EXCAVATED IN THE DEAD PITS FROM THE PERIOD OF GERMAN AND RUSSIAN OCCUPATION OF POLAND

Author(s): Openkowski, Rafal (Institute of History and Archival Sciences Nicolaus Copernicus University in Toruń) - Kulesz, Aleksandra - Michalik, Jakub (Institute of Archaeology Nicolaus Copernicus University in Toruń)

Format: Oral

Explorations of dead pits coming from WW II and the first years after it reveal human remains, together with a variety of objects and elements of clothes of the killed men and women. These are usually plastic and metal buttons, metal clasps and relics of leather footwear. Identification of both – persons and objects is always very difficult, but all excavated artifacts, during conservation treatment, were carefully analyzed in all their details. In few instances the murdered persons had boots and shoes on their legs, which seemed rather homogenous in the first examination, easy to qualify and identify their manufacturing places, as we supposed. However, their long use, numerous repairs and depositions in dead pits for at least 65-75 years, disturbed their original constructions and made difficulties in their analysis. Excavated shoes not always turned out to be civilian shoes and the high boots were both of Polish and Russian production. High boots and woollen socks also hid additional information, e.g. pieces of paper or indelible pencils serving for writing kites from imprisonment. The socks contained only torn fragments of upper writing pad part, but we will never know if these secret messages ever reached their receivers.

3 MERCURY AND THE PRACTICE OF INTERPRETATIO ROMANA. THE SIGNIFICANCE OF BRONZE STATUETTES FOR A BROADER INTERPRETATION OF RELIGIOUS PROCESSES

Author(s): Szigli, Kinga (Ludwig-Maximilians-Universität München)

Format: Oral

The primary sources in examining religious beliefs, cults of the Roman provinces and the complex process of interpretatio Romana, are, apart from the ancient votive inscriptions, which give evidence for hundreds of divine names, the literary sources, which are sometimes more detailed and include information about the character and function of individual Mediterranean and indigenous divinities. Though they may help us understand the interpretatio Romana as an identification system, they do not reveal all facets of this complex phenomenon. Moreover, the passages of ancient authors, especially those from Caesar, Tacitus and Lucan reflect similarities and differences by shedding light on religious beliefs and the process of 'assimilation' as a whole. In order to balance such anomalies, the present work aims to confront written sources with the material culture. Apart from epigraphic sources, bronze figurines of deities proved to be the most suitable for this task. In a case study, bronze, silver, lead statuettes of the god Mercury from Pannonia are put in contrast with the belief system, cults, divergent interpretations and nomenclature of the literary texts and the votive inscriptions. As further reference, some significant epigraphic sources, stone statues and bronze statuettes from provinces with a different intensity of Romanisation are involved in the research, as well, such as artefacts from Britain, Gaul and Germany. The analysis of small figurines and further depictions enables to solve a range of problems in terms of religious identification, iconographical uncertainties and questions of archetype arising from descriptions of ancient authors as well as more complex religious matters, for instance intensity of Romanisation and extent of various cults.



4

AMBER AS A RAW MATERIAL IN PREHISTORY: APPEARANCES THAT ARE DECEPTIVE

Author(s): Czebreszuk, Janusz (University of Adama Mickiewicz in Poznań)

Format: Oral

Amber belongs to a small number of raw materials (such as metal, semi-precious stones, ivory), which played a great prestigious role for millennia and throughout the European continent. Natural deposits of various varieties of amber are known from many regions of Europe, but undoubtedly the greatest cultural significance was succinite, Baltic amber, whose largest deposits came from the south-eastern Baltic. The pan-European career of this raw material began at the turn of the 3rd and 2nd millennium BC. It is an organic material, very soft, so it should seem very easy to process. Research on the development of amber technology indicates that the basic techniques of its processing (drilling holes, cutting, grinding, polishing) were already known in the Neolithic. In-depth studies on the spread and nature of amber processing relics show, however, that this was not an easy craft. The paper will cover basic issues showing barriers to the development of prehistoric amber making, which were both of a raw material, technical and cultural nature.

5

ARTEFACT’S EVALUATION SYSTEM FOR A SOCIO-ECONOMIC INTERPRETATION. EXPERIMENTAL APPLICATION TESTING ON MIRANDUOLO VILLAGE DURING IXTH CENTURY

Author(s): Menghini, Cristina (University of Pisa) - Palmas, Carla - Nardini, Alessandra - Bertoldi, Stefano (Università di Siena)

Format: Oral

After New Archaeology’s theories the mathematical methods and quantitative approaches are largely used in Archaeology. Starting on the observation of an archaeological site we would propose a numerical multivariate analysis to test a normal distribution and positive/negative elements of richness, evaluating the stratigraphic levels and their artifacts. Glasses, metals and potteries are the best material evidences to understand the structure of the society. For any of these artifacts we have to establish a different value based on quantitative and/or qualitative level to define the measure of the richness. To manage the useful results we will set up every parameter according to a specific list of numbers, based on the importance of the markers. In this way it will be possible to observe “how many” and “what are” the impact on the evaluation of the richness. The purpose of this application is to define the distinctive hierarchical elements for the people of Miranduolo’s village. Today, what we know about Miranduolo during the IXth century is the classical organization of the model “azienda curtense”: “power zone” with the family who control the site and the rest of the village. With this contribution we would propose an analytic method to help the researchers to understand the socio-economic differences inside of the settlement.

6

DAMAGING OBJECTS ON PURPOSE: RITUAL PRACTICE IN THE LATE BRONZE/EARLY IRON AGE SOUTH CAUCASUS

Author(s): Bedianashvili, Giorgi (Georgian National Museum)

Format: Oral

The beginning of the Late Bronze Age (15th century BC) in the south Caucasus is associated with the development of tin bronze metallurgy. In graves, hoards and open air sanctuaries there occur a large number of bronze artefacts of various types. Some of these objects were intentionally damaged; this is the result of ritual acts prior to their deposition, which is a novelty for the Late Bronze Age in this region. This paper focuses on the patterns of this ritual breakage as found in the territory of Georgia. In terms of comparison, it also discusses the connection of this ritual practice outside of the south Caucasus, where there are much longer traditions of intentional breakage of artefacts. This ritual practice has never been examined for the south Caucasus as a whole. In this regard, this paper represents a first attempt to understand a ritual aspect of the lives of the Late Bronze Age populations in this region.

7

AMBER IN THE EUROPEAN BRONZE AND IRON AGE: ARCHAEOLOGY, CHEMISTRY AND MICROSCOPY

Author(s): Tsuvaltsidis, Aude (Sorbonne Université; Karlova Univerzita)

Format: Oral

The amber has been used since the Palaeolithic until nowadays and was broadly exchanged all across Europe during the Bronze Age (2300-800 BC) and the Iron Age (800-52 BC). The importance of the amber trade is defined by the notion of “amber roads”. This concept was created during the 19th century and was linked to the numerous discoveries of “princely graves” which contained amber beads. This material has been mostly studied from a typological point of view or only mentioned without further explanations. Chemical analyses were more widely developed on ambers during the second half of the 20th century. They allowed to characterize the material and to determine its origin. However, these methods were not systematically applied to archaeological finds. Recently archaeological studies started to include chemical analysis in order to understand the geographical gap between the area of natural deposit and the zone of consumption. The aim of our contribution is to present an interdisciplinary method for the amber trade studies by crossing archaeological data with chemical and micro-analyses. Infrared spectroscopy helps to determine the origin of the samples whereas new technologies such as high-resolution microscope enable to identify tool traces left on the surface of

the artefacts. As a case study, archaeological ambers from Hallstatt/La Tène periods in France and Bronze Age in Czech Republic will be discussed. The recontextualization of the objects is essential to understand if this material was only dedicated to elites or to a wider part of society according to the different cultural areas. Furthermore, this paper is also related to the questions of local and interregional trade as well as material influences going along those “amber roads”.

8

BLUES AT BARCELONA: MAIOLICA PRODUCTION AND DISTRIBUTION INTO THE CITY BETWEEN THE 15TH TO THE 17TH CENTURIES

Author(s): Peix Visiedo, Judith - Madrid i Fernández, Marisol - Buxeda i Garrigós, Jaume (ARQUB/GRACPE; Universitat de Barcelona) - Capelli, Claudio - Cabella, Roberto (Dipartimento di Scienze della Terra, dell’Ambiente e della Vita - DISTAV; Università degli Studi di Genova)

Format: Oral

Up to the 15th century, Valencian blue maiolica came into Barcelona in huge quantities, having a wide distribution into the city. Due to a crisis period in Valencia, Italian pottery, especially products from Liguria, occupied the space left, being the 17th century the most brilliant period, causing in some cases the discomfort of local potters due to the high presence of the Italian vessels. In parallel with those processes, maiolica with blue decoration was locally produced, found in archaeological contexts first with Valencian vessels, and finally with Italian ceramics. These local products get the inspiration in the forms and the decorative motifs of the mentioned importations (and in some cases imitating it), trying to find a local market to sell them. The main objective of this study is to identify the distribution of local blue maiolica in the city of Barcelona. Up to now, thanks to the TECNOLONIAL project, many workshops have been archaeometrically characterised by means of x-ray fluorescence (FRX) and x-ray diffraction (DRX). The next step is the characterization of maiolica products found in archaeological well-dated contexts of Barcelona, with the willingness to go deep inside in social, cultural and economic aspects of the population. Archaeological sites with a relevant presence of imported ceramics could be related to a high social class. To do that, blue maiolica has been studied also by means of FRX to attribute them to a known established reference group, and by means of DRX, SEM-EDX and Optical Microscopy to obtain information about the technical production. Furthermore, OM and SEM-EDX have been used to analyse glazes, with the goal of discerning whether the decorative motifs and the ways of producing can be used to discriminate crafts.

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