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

Theme: 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? 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 those related topics:

- Combined approaches 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.

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 (omprospection) · 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 (Đakovo-Baranja County, Croatia) was first mentioned in 1960s (Đimirović, 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 35 hectares was surveyed using a multi-sensor fluxgate gradiometer array with GPS-RTK positioning. The large-scale data show
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 Kremenjalja, the 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 Gorjá-Topola, so that a larger prehistoric agglomeration of at least 100 hectares can be assumed. Excavation and magnetic prospection were accompanied by coring, both in the central part of the Kremenjalja set-
ment and in the surrounding outer ditch system. A joint interpretation of all data sets contributes to understand the settlement development and to set up a chronology of this Prehistoric complex. The presented example proves that substantial archaeological information can be gathered even from fragmented data sets, including magnetic survey, excavations and coring.

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

**Abstract author(s):** Erkinov, 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) - Ugalova, Nani - Mitrofanov, Sergey (Institute of Archaeology, Russian Academy of Sciences)

**Abstract format:** Oral

In the Suzdal Opolie region the archaeological searching for medival 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-IX 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/sand formation and historical-time agrogenic transformations.

To distinguish between the soil heterogeneties and burial site archaeological objects with irregular shape, one should treat the archaeological 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 (2900 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 necropoleic structures, 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 grounds, acceptable for ascertainment of the burial sites boundaries and for mapping of their internal arrangement.

The work was supported by Russian Scientific Foundation grant NT19-18-00538.

**3**

**"WHY ISN'T IT WORKING?!" - WHEN ARCHAEO-GEOPHYSICAL PROSPECTION MEETS UNFAVOURABLE GEOLOGICAL CONDITIONS**

**Abstract author(s):** Pisz, Michał - Mieliszewski, 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 always be 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 unearthen re-

mains.

However, probably most of us experienced these tough and unsatisfying moments, when after a whole day of measurements con-
ducted 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.

**4**

**COST ACTION SAGA 171131**

**Abstract author(s):** Chavez-Garcia, Carmen (CNTU)

**Abstract format:** Poster

Geophysical prospection currently stands as a powerful tool 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 subsurface 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 archae-
ological features), the Soil science & Archeo-Geophysics Alliance (SAGA) was funded by the EU COST Action. 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.
**ABSTRACTS**

1. **SAMI OFFERINGS, ENVIRONMENTAL CHANGE AND INSECT ASSEMBLAGES FROM NORTHERN NORWAY**
   - **Abstract author(s):** Panagiotakis, Evi (School of GeoSciences, University of Edinburgh)
   - **Abstract format:** Oral

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, Tuja (Department of Cultures, University of Helsinki) • Mannnermaa, Kristiina (Department of Cultures, University of Helsinki; Archaeology Department, University of Tartu)
   - **Abstract format:** Oral

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) • Masl, Alessia • Vignola, Cristiano (Department of Environmental Biology, Sapienza University of Rome; Max Planck Institute for the Science of Human History, Jena) • Sodir, Laura (Department of Environmental Biology, Sapienza University of Rome)
   - **Abstract format:** Oral

4. **UNRAVELLING THE FUNERARY RITUAL: EARLY IRON AGE MINERALIZED TEXTILE REMAINS FROM TUMULUS 6 AT KAPTOI IN CROATIA**
   - **Abstract author(s):** Filip Kenberger, Julia • Potrebica, Hrvoje (Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb)
   - **Abstract format:** Oral

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 the ERC funded project Animals Make Identities, the Social Bioarchaeology of Late Mesolithic and Early Neolithic Cemeteries in North-East Europe (ANI), we are testing the microarchaeological analysis of soil samples from Mesolithic burials to identify fibres, such as hair and feathers. Animal hair and feathers have been used in various cultural contexts, being the material of choice for making clothing, tools, ornaments, and depictions in art. 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 Donkalnis, Lithuania, Yuzhniy Oleniy Ostrov, Russia, and in Majoon Suo, Finland.

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 practices may include specific attires as well as specific 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 alkaloids in pre-Hispanic funerary contexts suggest, that this bottle type may have served as container and administering device for potent liquid preparations stimulating 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 botanic species like...
COMBINING MOLECULAR AND ARCHAEOLOGICAL ANALYSES ON BIOARCHAEOLOGICAL REMAINS: THE CASE-STUDY OF PASTENA CAVE, A PROTOHISTORIC ITALIAN RITUAL SITE

Abstract author(s): Corte, Francesca (Prehistoric Archaeology Laboratory, University of Rome Tor Vergata) - Silvestri, Latvia (Prehistoric Archaeological 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 Archaeological 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 a variety of plants, especially vegetables. Noteworthy, the rituality of the cave is especially indicated by the exceptionally numerous burnt human remains, the scattered human bones, the depositional features of the artefacts, and the restructured, stratified 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 isotopic 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.

COMBINING DENTALVEOLAR AND STABLE ISOTOPE ANALYSIS FOR DIET RECONSTRUCTION OF ARCHAEOLOGICAL POPULATION FROM BIJELA, CROATIA

Abstract author(s): Budic, Željka (Croatian Academy of Sciences and Arts) - Janeč, 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 archeological 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 dentalveolar 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 analysis between sexes and social groups inside the population will be conducted to see if there was a different food consumption pattern among specific groups.

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) - Potakhina, 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 dentine 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 transitories. For instance, the Mosči-Neolithic Hg populations from the Baltic region show a similar pattern of subsistence to the Mosči-Neolithic Hg populations from the riverine Dniester rapids area in eastern NPR. On the other hand, the riverine Hg Mosči-Neolithic populations of the Iron Gates of the Danube relied 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 protein coming from animals consuming C4 plants.

THE FIRST MUSLIMS IN SANTAREM: AN ISOTOPIC INVESTIGATION OF DIET IN ISLAMIC MEDIEVAL PORTUGAL

Abstract author(s): MacRoberts, Rebecca (HERCULES laboratory - University of Évora) - Teixeira, João (University of Adelaide) - Librario, Marco (Centre de Estudos de Arqueologia, Artes e Ciências do Património) - Valente, Maria João (Faculty of Human and Social Sciences, University of Algarve) - Melício, Claudia (Research Centre for Anthropology and Health - CIDEHUS, University of Coimbra) - Barroso 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 - CIDEHUS, University of Coimbra; School of Technology Sciences, Department of Biology, University of Évora) - Barros, Filomena - Vasconcelos Vilar, Hennima (School of Technology Sciences - CIDEHUS, University of Évora) - Maurer, Anne-France (HERCULES Laboratory, University of Évora)

Abstract format: Oral

The Islamic control of Iberia during the 9th-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 Aia de Gafas in 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 9th/10th century. This is potentially supported by the anthropological features of some of the excavated skeletons, which are typically 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.

NEW WORLDS FOR ANCIENT WORLDS

Abstract author(s): Antonino, Riccardo (Robín Studio - Politecnico di Torino (DAUMI)) - Quarra, Gianfranco (Arezzo-3 area)

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 Robín Studio, together with IMA Solutions, in creating multimedia and graphic content of the temporary exhibition “Invisible Archaeology” at Museo Egizio in Turin, is presented as a case-study.

Modern archaometry 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.

EXPERIMENTAL PROJECTS ON THE DIET OF ANCIENT SOCIETIES

Abstract author(s): Zlab, 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 analyses in order to reproduce their contents. For chemical analyses, compressed gas chromatography with mass spectrometry and stable isotope analysis were used.

First, qualitative and quantitative content of fatty acids from each sample was used to interpret the results. After their analysis, mass spectrometry and stable carbon isotope analysis were used.

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):** Škaliva, Tereza (Institute of Archaeology, Faculty of Arts, University of South Bohemia in České Budějovice; Laboratory of Archaeobotany and Palaeoecology, Faculty of Science, University of South Bohemia in České Budějovice; Buddel, Jan (Laboratory of Archaeobotany and Paleozoology, Faculty of Science, University of South Bohemia in České Budějovice) - Koni, Peter (Department of Molecular Biology, Faculty of Science, University of South Bohemia in České Budějovice) - Pavlič, Jaroslav (Faculty of Education, University of West Bohemia) - Obreja, Ondřej (Institute of Archaeology, Faculty of Arts, University of South Bohemia in České Budějovice) - Kuna, Martin (Institute of Archaeology of the CAS, Prague) - Mandlik, 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 starch (e.g., wheat, barley, rye, oats) and phytoliths (e.g., rice, sorghum, maize) was identified. The results of the analysis suggest that the grinding stones were used for the processing of cereals.

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c.

**VALUING ANIMAL REMAINS FOR RECONSTRUCTION OF HUMAN DIET IN THE BRONZE AGE COMMUNITY OF ȘOIMUS-TELEGHI (ROMANIA)**

**Abstract author(s):** Malaxa, Daniel (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Tudor, Marc (Daciaan and Roman Civilisation Museum, Deva) - Stanc, Simina (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Ibejanu, Luminita (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Iasi 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 prehistoric remains recovered from the Bronze Age complexes, evaluated the animal resources in human diet, in terms of paleo-economy (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 hunted 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), sauroch (Bos primigenius), roe deer (Capreolus capreolus), wild boar (Sus scrofa), (Canis lupus), (Ilurus arcticus), hare (Lepus euopeaus), 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) - Itso, Nobuyuki (Nagoya University) - Fukaya, Misaki (Kyoto Foreign Studies University) - Aiba, Nobuhiko (Nagoya University)

**Abstract format:** Poster

El Trapiche is an archaeological site located in Chichuapa (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 (c. 1000 BC - 0 AD) with the development and continuous use of the area for around 9000 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 has been through GPR (Ground Penetrating Radar) in order to map the structures in the southern part of the site E9-1 (main area), E9-2, E9-3, E9-4, E9-6 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), related to the end of Late Classic Period and the results obtained in the analysis of feldspar, volcanic ash, the results obtained in the analysis of the volatile part of the archaeological site, and the results of the analysis of the volatile part of the archaeological site, and the results obtained in the analysis of the volatile part of the archaeological site.
The objective of this paper is to explore the connection between the house and the self in Late Iron Age Scandinavia. Houses transcend 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-conscious of the individual. 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.

SCOTTISH STRUCTURES AND OPPORTUNISTIC BUILDERS – LONGHOUSES IN NORTHERN NORWAY

Abstract format: Oral

The longhouse is a turnip heading 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 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 striping to ensure representative data.

NEGOTIATING NARRATIVES. AN EMPIRIC PERSPECTIVE ON NORSE REUSE OF ANCIENT MONUMENTS IN THE SCOTTISH ISLES

Abstract format: Oral

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 one’s own history on a foreign landscape – evidenced as a material representation 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. Here I argue that the burial function as active mnemonic nodal points in a sentient narrative landscape – where practice links past to present 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 regeneration of place with foreign entities – past and present. The focus of my discussion is the Westness burial ground on Rousay, Orkney.

SEARCHING FOR A SCOTTISH-NORSE IDENTITY IN THE EARLY VIKING AGE

Abstract format: Oral

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 unaddressed. 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 sites such as Cille Pheadair and Bornais, a better understanding of the Scandinavian presence during this period is emerging. 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 area. 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.
9
SYMBOLS IN ACTION: REANALYZING BROOCHES IN VIKING AGE BURIALS
Abstract author(s): Cartwright, Rachel (University of Minnesota)
Abstract format: Oral
Although they serve a functional purpose, brooches are often used and interpreted as a means of messaging. Present-day political figures such as Madonna Abbott 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 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 quantity and quality 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.

10
NETWORKS OF THE VIKING-AGE SLAVE TRADE IN ARCHAEOLOGY AND TEXT
Abstract author(s): Delvaux, Matthew (Boston College)
Abstract format: Oral
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 cemetery 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?

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 challenges archaeologists to give increased attention to the定了 that slavery 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 remaining 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.

11
REAL OR IMAGINARY BREAK IN SETTLEMENT CONTINUITY OF THE 11TH CENTURY ÅLAND ISLANDS
Abstract author(s): Ives, Kristin (University of Helsinki)
Abstract format: Oral
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, where the over-exploitation of its resources as well as the slave raiding have been suggested as a cause, many Greek islands in the Mediterranean were completely or almost completely deserted for certain periods due to 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 1950s 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 played 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 how the study has been 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.

12
A FAITH IN-BETWEEN: THE MERGING OF CHRISTIAN AND PRE-CHRISTIAN IDEAS DURING THE CONVERSION OF VIKING AGE SCANDINAVIA
Abstract author(s): Thores, Jhony (Uppsal University, Dept. Archaeology and Ancient History; Kalmar County Museum)
Abstract format: Oral
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 11th and 12th centuries as a case study.

The study triangulates three different types of sources. The version of the Gospel that was adapted by the missionaries from the Sea of Hamburg, like Ansgar the Apostle of the North, as expressed in the Saxon Gospel Helland. The many rune stones raised in Eastern Sweden during the 11th century expressing the Christian ideas as carved stone memorials. And finally, the burial practices

that change drastically during the conversion period, transforming the old burial practices 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 within which, from our perspective, neither can be labelled Christian nor Pre-Christian.

45
CURRENT RESEARCH ON BRONZE AND IRON AGES HOARDS
Themes: 5. Theories and methods in archaeology: interactions between disciplines
Organisers: 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)
Format: Regular session
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. 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, metallographic studies, microscopic analysis of use-wear traces and destruction of metal objects, archaeometric analyses of art- 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.

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. If your research interests are:
- hoards from the Bronze and Iron Ages;
- additionally, by analyzing them, you use a multidisciplinary approach;
- or you propose the use of methods that were previously not used in research of hoards;
- and/or would like to propose a new theoretical approach to interpretation this phenomenon.

We would like to invite you to participate in our session and we hope that it will be very inspiring.
THE UNRFIELD PERIOD METAL HOARDS IN SOUTH BOHEMIA: FIND CIRCUMSTANCES, TOPOGRAPHY
AND ANALYSES

Abstract author(s): Chvojka, Ondřej - Joho, Jan - Šálová, Tereza (University of South Bohemia) - Kimešek, Jiří (University of Par-
dubno)

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 metalurgy, 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 (shapes, river banks, hill tops etc.) provide a clue for their interpretations?

• Chemical analyses of artefacts from hoards. In the last years we have 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
understanding 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 IV – Vla). Some of them can give us answers to the mentioned questions or to the interpretation of
some hoards.

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

Abstract author(s): Zagórski, 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
Age. Visually attractive and concealing the secret of the deposition act, since the end of the 19th century they have been routinely
used in typological and chronological studies. From time to time the problem of synchronicity of all elements of these sets is raised,
since knowledge about the methods of collecting and selection criteria for items included in deposits is still poor. From the other
hand there is evidence for long-accumulated hoards, or long-lasting tradition of particular deposition places. Therefore, it is crucial
to identify potential transformations occurring at all stages of the formation of “hoards” as a category of archaeological sources.
Awareness of these problems and the use of adequate source criticism tools allow us to use the potential hidden in these assem-
bles as a basis for statistical analyses. These, in turn, help us accurately reproduce the dynamics of stylistic changes, comparable
sometimes to that known from the younger stages of the Iron Age.

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-focused 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 metalic hoards in landscapes and settlement or funerary sites. A synthesis of these new data is presented here, based
on the ongoing excavations at Saint-Ouen (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 confusion, 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.

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

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

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 Mures valley, at Tărtăria (Alba county, Romania). The two hoards were discovered within an “outlying ditch” (a par-
ticular 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 B.C period in the Carpathian Basin, while the second consists of 50 objects. There are a series of
multidisciplinary investigations made for the further study of these finds. In the framework of the PLOT project, we made a series of
speto-electronic investigations upon more than 120 objects (of bronze and iron) spectroscopic recordings (LIBS and XRF) on cer-
tain objects, but also a series of X-rays of the “nuclei” of objects from the Tărtăria 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 ob-
tain 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 “Bâlvănești - Vint” horizon (“DVF V - VII”). 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.

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

Abstract author(s): Treaddow, 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 com-
mon 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 types, and
patterns within deposition practices for both inter- and intra-regional comparisons. For example, the favoured material used for ob-
ject 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 categorial 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 con-
test the intention of deposition, the result of such practices was clearly to strengthen social bonds for the nuclear, extended,
or communal groups associated.

FRAGMENTATION OF METAL IN BRONZE AGE EUROPEAN HOARDS

Abstract author(s): Lego, Giancarlo (Sapienza Università d’ Roma)

Abstract format: Oral

From the Middle Bronze Age, a change appears in central European hoards. Complex groups of broken items compose random clus-
ters. A considerable and growing number of fragmental 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 stud-
ies dealing with the fragments are still lacking. Detailed research on the phenomenon is proposed here. The research has been led
on over 15000 bronze objects and over 350 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 sug-
gest that the ritual fragmentation and breaking to recycle should be debunked. Most of the fragments probably were traded many
times before to be deposited.
THE DEPOSITION OF INNOGLSTAD-DÜNZLAU (BAVARIA) AND THE FRAGMENTATION OF BRONZE OBJECTS IN LATE BRONZE AGE SCRAP-METAL HOARDS

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

Abstract format: Oral

The paper deals with the Late Bronze Age hoard of Innsbruck-Dünzlau in Bavaria which was excavated in 2014. It consists of over 1,800 objects weighing more than 8.5 tons, thus making it by far the largest known deposition from the Umfeld period in southern Germany. The hoard contains a wide range of objects like weapons, tools, ornaments, ingots and casting waste. About 97% 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-Universität Freiburg. This far I have recorded and documented all of 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-Universität 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 metallographic and metallurgical analyses and experiments on modern replica of bronze artifacts.

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

Abstract author(s): Dyógyi Györgyi, Szilvia - Juhász, Laura (University of Debrecen) - Balkoczky, Péter (University of Miskolc) - Chas, Juliana (Tatabánya Múzeum) - Szabó, Géza (Wosinsky Mór Museum Székeszázdár)

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 structural analysis and examining the corrosion processes we could trace the biography of those objects, even after removed from use. The data and the observations reflected the use of varying base materials and extremely diverse technologies. Evaluating those 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 sheds 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.

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

Abstract author(s): Mehrofer, Mathias (VIAS, University of Vienna)

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 characterized. The hoard 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 bivalve 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/H53/01097 and Ministry of Culture and National Heritage (Poland).
INTERACTION IN ACTION: HUMAN AND SOCIETAL ADAPTABILITY IN RESPONSE TO CHANGES IN CLIMATE AND ENVIRONMENT IN MEDIEVAL EUROPE

Theme: G. Theories and methods in archaeology; interactions between disciplines

Organisers: Lofthusgard, Kjetil (Museum of Cultural History, University of Oslo) - Svensson, Eva (Karlostad 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 induced 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 new data to the archaeological community.

We therefore especially welcome papers handling big data and presentations on interdisciplinary studies.

ABSTRACTS

1. THE DEMOGRAPHY OF IRON AGE SCandinavia

Abstract author(s): Lofthusgard, 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 have severe societal impacts, these are seldom explicitly defined or quantified.

In this paper, we will use a systematic approach to analyse palaeo-environmental data from archaeological sites in Scandinavia. We will identify and understand the long-term societal responses to sudden shifts in climate. Specifically, we will explore the drivers and the past populations in Scandinavia in the period 1 - 3000 AD, and how these relate to climate and environmental changes.

In Southern Scandinavia, burial urns were used up until the 11th century. This comparatively homogeneous 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 inheritance over time. In addition, we 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 a series of devastating plagues over the following decades.

By investigating archaeological and climate data from the centuries AD 500-800 across Scandinavia, we seek 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 amount of data from material settlements, production sites, etc. with associated archaeo-environmental data 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 the Early Middle Ages (500-1500 CE) (VINNOG) (2019-2023) funded by the Norwegian Research Council and the University of Oslo (NFR TOPPORSK, grant 276191).

3. DID THE 536 DUST VEIL EVENT START IN AD 410? SOCIETY, RESILIENCE AND BAD YEAR ECONOMICS

Abstract author(s): Gjerpe, Lars Eik (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 are few and long periods with low summer temperatures occurred throughout history and prehistory without much devastating effect. 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 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 assemblages such as weapon combinations, started before AD 536. I will explore if the fall of the Roman Empire and the subsequent lack of prestige goods in Scandinavia undermined the elites, 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): Abiris, Sofia 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 personal 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 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. This paper will discuss if it is possible to use 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 the Early to the 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 from the 6th century AD onwards led to a series of environmental changes that affected the entire Po basin.

Urban and rural settlements were affected by changes in the natural environment, such as changes in the local hydrology and the variability of the climate. These changes led to a decrease in the availability of resources and a shift in the ways in which people used the landscape.

The research presented is part of the ongoing project Volcanic Eruptions and their Impacts on Climate, Environment, and Viking Society in the Early Middle Ages (500-1500 CE) (VINNOG) (2019-2023) funded by the Norwegian Research Council and the University of Oslo (NFR TOPPORSK, grant 276191).
role in human resilience to geomorphological hazards related to alluvial context and exceptional floods triggered by climate changes.

6 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) - Petterson, Susann (Norskt maritimt museum)

Abstract format: Oral

It is generally considered that marginal upland areas were colonized by agrarian settlement fairly late, when good land for agriculture was also presumed. But it is also presumed that in times of settlement decline, such as during the late medieval agrarian crisis (in the 14th century), marginal upland areas were first abandoned as surviving people moved to well-landed and farmed areas 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 fosilled areas 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 paleoecological 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 Wales, I argue that ‘local’ perspectives may provide more realistic explanations of the phenomenon. I highlight how various factors – the arthropothesis of soil through transhumance, the presence of favourable geography, continuities from prehistory and the availability of non-agrarian resources – could play crucial facilitative roles at a local level. Indeed, when combined with regional socioeconomic 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 this local environmental contact 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) - Zatykè, 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 palaeo-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 indirect extent of their correlation. This paper, focusing on two different geographical regions of Hungary, attempts to shed light on the possible affects 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 Tristania 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 interpretative 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.).

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

Theme: 6. Theories and methods in archaeology: interactions between disciplines

Organisers: Wild, Markus (ZBSA - Centre for Baltic and Scandinavian Archaeology; UMR 7041 ArScAn - Ethnologie préhistorique - Sideral, 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 those objects. The technologies and techniques that make up the basis for prehistoric tool production, like any other traditional techniques, 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, the discussion ends on such a matter-of-fact point without any further enqury 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 social 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, ossaceous, 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 ethnoarchaeology, comparative case studies, technological analyses, chaîne opératoire, palaeosociology, or agent-based modeling, in order to ultimately join our efforts to approach the extremely vast and complex topic of knowledge transmission in hunter-gatherer societies.

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

Abstract author(s): Børg-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 practices 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 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 usually 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 Erlois, 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
extant 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?

3 LEARNING THE HARD WAY - FLINT, PRESSURE AND TRADITION

Abstract author(s): Söderlund, 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) relatint to flint knapping, is one such example.

The production of blades using pressure technique is considered to be technologically complex (Pelegrín 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 technique 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:

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 - Instituto de Investigación en Arqueología y Patrimonio Histórico - INAPH, Universidad de Alicante)

Abstract format: Oral

The spread of trapeze-based industries in Europe, also known as the “second Mesolithic”, has 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 Pablos, accepted for publication). In this contribution, 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 Iberian Valley. We use new network analysis and agent-based modelling to study 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-societal spatial network contributes to a better understanding of the contexts in which cultural transmission occurs.

References:
- Romano, V./Lozano, S./Fernández-López de Pablos, J. (Accepted) A multiplicative 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): Wulff, Markus (ZBSA - Centre for Baltic and Scandinavian Archaeology, Schleswig, UMR 7041, Archéologie du Quaternaire - CNRS (XXVe supplément à Gallia Préhistoire), 168 p.

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, as 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 1961. 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 chaine opératoire approach, and as it is this chaine of this study that initially explored such topics materiali, beginning with the fundamental work of Pigot in 1987. As such a method is inherently bottom-up, it situates individual action within the structure of traditional technique, 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 40,000 and 10,000 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.


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

Abstract author(s): Grob, Daniel - Lübke, Harald - Meadows, John - Schmitzke, 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 time frame. However, recent studies highlight that we are able to trace far more diverse and complex 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 (3300-2150 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; Fennoscandinavia (TGB), Corded Ware (CW) and the Battle axe Culture (BAC), this was not the case along the western seaboard. Agriculturally this is not economically important in either region and the Late Neolithic (ca 2500 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 Scandinavia 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 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, Sitanand College, Purba Medinipur, West Bengal)

Abstract format: Oral

After dating the site Mehtakheri (Madhyapradesh) and Jhalaupar (Madhyapradesh), it has been suggested that microolithic technol- ogy 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 microolithic occurrences of the Levant and Arabian Peninsula. Until quite recently, South Koel River Basin, North-Westen Odisha revealed from microolithic 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 50 open-air microolithic sites with the total tool assemblages amounting to 2474. Those are mainly com- prised of bidirectional blade core, unipolar core, lunate, scraper, bladelet, and adhoc tools. The microolithic stone tool assemblages were representative of their dimensions and technological attributes which further emphasizes the affinity among the cul- tural remain in between these two regions.

10

INTERPRETATIVE POTENTIAL OF PALEOLITHIC CHERT QUARRY SITE STELIDA ON NAXOS, GREECE

Abstract author(s): Mihaliev, Danica (Institute of Archaeology, Serbian Academy of Sciences) - Carter, Yvonne (McMaster University) - Mouftisou, Dora (University of Cyprus) - Dragasavas, Sofía (University of Belgrade) - Zoghbi, Clara (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 Paleolithic sequence in the central Aegean basin spanning from ca 200,000 BP to 10,000 BP. Silicate material sources represent very important type of sites that are heavily understood in the Paleolithic archaeology. Paleolithic quarry sites are remarkably rare, with the handful that have been documented (in Egypt, India, Israel, Iraq, Jordan and Turkey), with very few excavated. Hence, quarry assemblages provide us with the rare opportunity to gain information on behavior on the site where abundance of raw material were being very important and exploitation/experimentation. Those factors should also lead to the spectrum of innovative products as a form of adaptation and development of economical 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 materia- rial (clusters of cores) from different phases of Paleolithic of Stelida.

55

CASTLESCAPES

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

Organisers: Pluskowski, Aleks - Banerjea, Rowena (Department of Archaeology, University of Reading) - García-Conteras Ruiz, Guillermo (Departamento de Historia Medieval y Ciencias y Técnico Historiográficas, Universidad de Granada) - Karczewski, Ma- ciuć (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 last EAA meeting in Bern, this session focuses on mul- tipolar 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 it is studied and why should it’s be included in heritage management and policy 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 de- fined by written sources relating to property and landuse. 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 recon- nected 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.

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 modern features of the landscape as proxies for historic ones, and 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 incastramentall, 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): Banerjea, Rowena (University of Reading) - García-Conteras Ruiz, Guillermo (Universidad de Granada) - Karzczewski, Maria (University of Białystok) - Karczewski, Macius (University of Krakow) - Pluskowski, Aleks (University of Reading)

Abstract format: Oral

This paper 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 transfor- mation 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 landuse to be examined at high resolution, specifically the macro- 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 landscapes. The geoarchaeological approaches has been used to explore how castles were transformed into discourse? The aim of this session is to continue to explore how these key regional monuments can be recon- nected 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.
3 POST-ROMAN ‘CASTLESCAPES’ IN NORTHWESTERN IBERIA: AN ARCHAEOLOGICAL OVERVIEW OF HILLFORT OCCUPATIONS

Abstract author(s): Torejós, Carlos (Universidade do País Vasco) - Rodríguez, Celia (Universidad 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 Prehistoric phases of these sites centered most part of the discussions, commonly considering post-Roman occupations as ‘residual’. However, recent excavations, research 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): Eirea, Jorge (Departamento de Prehistoria, Arqueología, Universidad de Murcia) - González, Jose (University of Murcia) - Martínez, Andrés (Museo Arqueológico de Lorca) - Celma, Miriam - 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-Islamic border and to define some archaeological indicators for the identification of Jewish medieval populations. In the last years, 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 anthropological analysis - comparing 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 character 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): Purti, 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 scenic rocky habitat, known since the Ancient times. When the cave represents an important land-marke 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 Medieval age, characterized by a dense network connection of these castles, fortresses 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 (Szant Istdv University, Institute of Nature Conservation & Landscape Management) - Merki, Máté - Schmidt Mayer, Richard (Kuny Domokos Museum, Tata) - Szilvási, Katalin (Szant 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, which greatly determined the location of the castle and the surrounding settlements. Using the swamps, King Sigismund created a lake next to the castle, which is still a dominant element of the landscape. There already had been a market town to the west of the castle, but soon another one formed on the eastern side near the castle. The castle was given a military role in the middle of the 16th century, because of the Ottoman-Hungarian wars, which also had a significant impact of the life of the area. Thanks to recent and older excavations, we partially know the castle and the older market town. The settlements of the rest of the castle territory are known only from the written sources and topographic researches. However, the finds of the excavations and field survey were coupled to compare the material culture of the castle area and the adjacent settlements. Archaeological finds were also discovered in the castle and its neighbourhood, which are currently being processed. We would like to present the results of these researches and examine the changing role of the castle and its effect on its surroundings in the Middle Ages and post-medieval times.

7 BORDER CASTLE IN MUSZNYA – INTERDISCIPLINARY STUDIES

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

Abstract format: Oral

The first stronghold in Musznya, 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 ruled the area 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 Tarnawa. 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 LUAr data contribute, thanks to which it was possible not only to determine the time of occupation 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 ABANDONED CASTLE (PUSTÝ HRAD) IN ZVOLEN (SLOVAKIA)

Abstract author(s): Balážik, Pavol (Department of History, Faculty of Arts, Comenius University) - Balážik, Ján (Archaeological Institute of the Slovak Academy of Sciences)

Abstract format: Oral

National Cultural Monument Deserted castle (Pusty 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 (671 m. a.s.l.) and 100 m below, they located the Lower castle (67 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 reliefs (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 reliefs 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 classic traditional 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 reliefs 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 LORSHIP – ONE CASTLE, ONE CASTLESCAPE?

Abstract author(s): Mazakova, Jana - Vaničková, Daniela - Žaža, Petra - Púčať, Andrej (Masaryk University)

Abstract format: Oral

Castle landscapes represent a myriad of social, economic, architectural and natural relations. The inner economies and economy of any castle are always very hard to piece back together to create a whole picture of life long gone. Especially from an anthropological perspective. Long-term excavation can reveal many important details, which may have not been previously thought of. Rokštejn Castle (Czech Republic, Jiříava 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 Castillo’s dispositional evolution and changes during single building phases from the late 15th century to 1467. Thanks to written sources, archaeological research, interdisciplinarity approach (e.g. archaeobotany, palaeoarchaeology), 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 (Muzeeul Civilizatiei Dacice si Romane)

Abstract format: Oral

The Muray 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 rivers. 13 fortifications are known in the county of Hunedoara. The five of them being constructed along the aforementioned valley during the 13th-16th centuries: royal, voivodal and nobiliary castles. Amongst these, the current paper brings forth the research of the Uroi fortress, one of the almost unknown monuments in Transylvania. The fortress was erected sometimes in the first half of the 16th century. It is located in the area where the Strie River flows into the Mureș River, close to the road which crosses from Târa Hatgulău south to north (one of the routes preferred by the Ottoman troopers for invading Transylvania from Wallachia). His nephew, while in the next century the court and the domain would become the property of the Kapi family. The will of Kapi Andrius 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, 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 Prussia and Jatviangan tribal territories. After the Teutonic conquest of Prussia – it became the borderland of the Duchy of Warsaw (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 persons appeared in the cultural landscape of studied area. In turn, the testimonies of wars fought here in the 17th and early 18th centuries 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, Godzisz, Krzeczkowo and Suraż (Podlachia).

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

Abstract author(s): Peukkonen, 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 preserved 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 akin 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): Miskołcz, Malinda (Nieman Otto Museum)

Abstract format: Poster

The poster examines the Castle of Dębicyr, located in Borość-Abaję-Zemplîn county, in the North-Eastern region of Hungary. The castle – built in the 14th century - never held any significant strategic value. Dębicyr was one of the favored residences of the royal court between the 14th and 16th centuries, also being a favorite of the Hungarian queens. The castle situated on a cone-shaped hill. At the end of the 1960s the structure had finished its 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, contrasting 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 Dębicyr have had?
- Where did the historical sources mention the “bathhouse of the queens.” Where could it be?
- How big was the ground-space of the Castle of Dębicyr in the Middle Ages?

63 THE ARCHAEOLOGY OF THE SKY

Theme: G. Theories and methods in archaeology: interactions between disciplines

Organisers: Pasztor, Emilia (Tîrî István Museum; International Society of Archaeoastronomy and Astronomy in Culture) - Frîncu, Marc (West University of Timișoara Romania, Faculty of Mathematics and Computer Science; Romanian Society for Cultural Astron.onomy)

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 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 (Tîrî István Museum, Baja; International Society of Archaeoastronomy and Astronomy in Cuture)

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 was and still is accessible to an archaeologist or historian. 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 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.
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 Feils, 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 "odd 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 focusses 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): Monro, Attília (Museum of Sopron)

Abstract format: Oral

In certain cases, the archaeologist had an easy task. Dig out, write 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 (Sonnennwirklichkeit – 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 probably seen easily in that area from the Late Bronze Age to the Early Iron Age: therefore we have an explanation why their symbolic "Language" changed 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 OMONOM IN THE ARMEINIAN HIGHLANDS

Abstract author(s): Revinici, 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 Sivasar 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.

5 AN ARCHAEOASTRONOMICAL PERSPECTIVE ON TWO SIMILAR LBA TUMULUS NECROPOLIS FROM ROMANIA

Abstract author(s): Dorogostoiu, Alexandru (Romanian Society for Cultural Astronomy – SRPAC, Archea 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) - Rogezea, Octavian (West University of Timisoara, Faculty of Letters, History and Theology; Archea Vest NGO)

Abstract format: Oral

The two sites are situated in the Carpathian Basin. The Lapus – Padarc 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 – Padarc site the summer solstice sunrise is aligned with the pyramid-shaped Hudin Peak and the sunset is aligned with the trapezoidal-shaped Satra Pintil Peak. The double alignment significantly increases the statistical chances for an intentional placement of the necropolis. It is hence likely that the summer and sunset sunrise during summer solstice were played an important role in the funerary rituals at Lapus.

The first tumulus from Susani – Grammadul la Tigoi is interpreted as an offering altar and deposit for vessels (around 250 have been found, some exhibiting stellar symbols) from the LBA period. In its area there is a tumuli, two other being currently excavated. During winter solstice sunrise occurs from behind the Padea 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 Déal 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 site 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): Hygginbottom, Gail (II Instituto de Ciencias del Patrimonio - Incript, CISCJ) - Mom, Vincent (Digital Preservation Projects)

Abstract format: Oral

In Hygginbottom 2020, it was shown that the interplay between the astronomy and the topographical choices of the builders of ma-

6 Archimaghic monuments highlighted possible cosmicological ideas 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 (Hygginbottom & 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 disinclination in orienting the standing stones to any solar target. More recently, on closer examination, one not 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 sites at individual monuments and integrate 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 WISHLING THINKING

Abstract author(s): Ziółkowski, Mariusz (Centre of Precolombian Studies, University of Warsaw) - Kosiuk, Jakub (University of Science and Technology of Wroclaw)

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 Llacta of Machu Picchu, in particular the Intihuatana 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 Mira-

bador de Inkasapay, has also been analyzed. This structure turned out to be built solely for the purpose of astronomical observations of the Sun 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 con-

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

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

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 Day 1, the other dates fall at 45 or 46-day intervals. These are the four familiar quarterly 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 data, arrives at the middle of the stone rising 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-playthulth. This implies that these stones symbolically indicated female and male genders—hence their dramatic watchable union by shadow at sunrise. These are logical aspects of 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): Henry, Ann (University of Wales Trinity Saint David, Journal of Skycape 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. Skycape archaeology, first proposed by Fabio Silka and Liz Henry in 2014, bridges the divide by thoroughly exploring and combining data obtained by both archaeological and archaeoastronomical methods and half-bak, to propose a holistic methodology which also includes a phenomenological and of leave approach to new research. The advantages are obvious and though archaeologists and prehistorians have been slow to consider the cultural impact of the skycape in their investigations and fail to understand the sky symbolism embedded in monumental constructions. To explore the advantages of skycape archaeology and how it can be put into 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 archaeologists and archaeologists. The aim of skycape 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 inter-disciplinary or multidisciplinary collaboration and shows how skycape 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): Mito, Zoltan (Institute of Geography and Earth Sciences, Faculty of Sciences, University of Pécs) - Ron, Gabor (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 Shot Vill Hill in the Hungarian Kőszeg-mount, 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 cff group of natural origin with a distinctive morphology situated approximately two and a half kilometers from this place, above Bécze village. Presently Shot Vill 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. On the south part of the cliff group, in a keelward place suitable for shelter too, an archaeological excavation found a fire place and potsherd, clay spoon, grindstone from the Late Bronze - Early Iron Ages. Based on the geodetic data of the territory of Hat Rock, we find 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 deterthe 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): Archeoastronomy

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 has been eradicated almost completely by the social change induced by colonisation. The Caroline Islands are one of those few places where autochtho nous navigational knowledge survived more or less intact up to today. The basis for the Carolinean system of navigational knowledge is the sidereal compass, a mental construction which sets geograpic coordinates by means of rising and setting points of certain stars. During the 20th century, several investigations gathered ethnographical evidence 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 Carolinean navigation, i.e. to present an interpretation of the sidereal compass which is closer to the ideas of Carolinean navigators.

12 ANYTHING ELSE WE CAN LEARN ABOUT MEDIEVAL CHURCHES?

Abstract author(s): Canav, Tatia (University of Reading)

Abstract format: Oral

Christian churches have been studied within various subdisciplines of archaeology, for example, Church archaeology, Roman archaology, 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 accept and adopt, but hard to prove. Correspondingly, it is the character of archaeology and history for them to become inadequate when attesting the fundamental yet intangible elements of the past facts. 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 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). Our findings provide 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 APOLLO’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 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 portara 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 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 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.
INTEGRATING APPROACHES TOWARDS STUDYING PLEISTOCENE PALEOECOLOGIES, 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 and taphonomic methods. However, this session aims 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.

Alongside traditional zooarchaeological analyses, which forms the foundation for any investigation of fauna in the past, there is a vast suite of biomolecular methods providing additional complementary data. Such approaches include: Zooarchaeology by Mass Spectrometry (ZooMS), bulk collagen isotope 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

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

Abstract author(s): Vasile, Stefan (University of Bucharest) - Petreșcu, Alexandru ("Emil Racoviță" Institute of Speleology, Bucharest); Romanian Institute of Science and Technology, Chișinău - Dumețiu, Valeriu ("Emil Racoviță" Institute of Archaeology, Bucharest) - Cosan, Mariam - Măruță, George ("Vladăilă" University of Târgoviște) - Alexandru, Radu (Culture, Cuts, 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 faunal assemblage can include specimens gathered from areas up to 10 km2, from a variety of habitats.

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

The small vertebrate fossil assemblage includes 15 taxa, some of which have marked ecological affinities: the occurrence of Arvicola amphibius and Palaeophlox 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 Dipsosaurus canariensis are typical to grasslands; and Chionomys nivalis prefers cold rocky habitats. The small vertebrate fauna indicates a mix of environments was present in the Vărghiș 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.

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

Abstract author(s): Smith, Geoffrey (Max Planck Institute for Evolutionary Anthropology) - Spassov, Rosen (Archeological Department, New Bulgarian University, Sofia) - Sirakov, Niolay (National Institute of Archaeology and Cults, and National Cultural Heritage Office – Dâmbovița) - Vereș, Daniel ("Emil Racoviță" Institute of Speleology, Cluj-Napoca)

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 I, the so-called ‘Bachkiriian’. 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, Nicha 1. Nicha 1 has produced considerable lithics (n=2300) and faunal (n=12500) assemblages from the K.P of Layer I (previously level I) and Upper Layer J, as well as the MP of lower Layer J and Layer K. New radiocarbon ages for Layer (of ~45ka 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-IUP 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 biomolecular data from proteomics and ancient DNA. Detailed zooarchaeological analysis highlights that Layer I accumulated largely through human exploitation of remains, and the role that this has to play in sampling strategies for further scientific analyses, remains a key topic for discussion. We will focus on the archaeological potential of using both zooarchaeological and biomolecular approaches to answer key research questions about past subsistence, faunal palaeoecologies 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.
DIRECT EVIDENCE FOR CLIMATIC CONDITIONS EXPERIENCED BY INITIAL UPPER PALEO-LITHIC HOMO SAPIENS AT BACHO KIRO CAVE, BULGARIA

Abstract author(s): Fedorov, Sarah - Britton, Kate (Department of Human Research, Max-Planck-Institute for Evolutionary Anthropology, Leipzig; Department of Archaeology, University of Aberdeen) - Aldeas, Vera (CAAnEH, University of Algiers, 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) - Simek, Geoffrey (Department of Human Evolution, Max-Planck-Institute for Evolutionary Anthropology, Leipzig) - Spassov, Rosen (Archaeology Department, New Bulgarian University, Sofia) - Tsanova, Tsuena - Hulin, 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 dispersal in the past and their adaptation to variable environments, such as the mid-latitude latitudes of Eurasia during the initial Upper Palaeolithic (IUP). While the general suggestion is that these dispersals occurred during the mild climatic intervals of interstadials such as OIS 14-15 or OIS 12 (e.g. Staubwasser et al., 2018), there is so far little direct evidence for this taphonomic 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 dispersal into Eurasia and contextualising their behavioural adaptations.

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 Bovidae and Equus tooth enamel, we construct 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 contextualisation of changes in subsistence strategies and animal resource exploitation within this IUP-MP sequence. Due to the lack of palaeoecological records from Bacho Kiro, the evidence from the IUP is so far the most 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.

ESR DATING LATE PLEISTOCENE BALKAN SITES: ESTABLISHING THE MIDDLE TO UPPER PALAEOLITHIC SEQUENCE CHRONOLOGY

Abstract author(s): Blackwell, Bonnie (RFK Science Research Institute, Dept. of Chemistry, Williams College, Williamstown) - Hladilly, Duslan (Dept. of Archaeology, University of Belgrade) - Mihalovic Bi Jana (Dept. of Archaeology, National Museum of Belgrade) - Roksandic, Mirjana (Dept. of Archaeology, University of Belgrade) - Todorovic, Dragosavac, Sofija (Dept. of Archaeology, University of Belgrade) - Dimitrijevic, Vesna (Dept. of Archaeology, University of Belgrade) - Turk, Ivan (Institut za arheologijo, SAZU, Slovenian Academy of Sciences, Ljubljana) - Skriver, Anne (Dept. of Chemistry, Williams College, Williamstown) - Kitanovski, Blagoja (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - Dimitrijevic, Vesna (Dept. of Archaeology, University of Belgrade) - Turk, Ivan (Institut za arheologijo, SAZU, Slovenian Academy of Sciences, Ljubljana) - Skriver, Anne (Dept. of Chemistry, Williams College, Williamstown) - Kitanovski, Blagoja (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - PLAŠVIĆ, Sanja (Dept. of Archaeology, National Museum of Belgrade)

Abstract format: Oral

Dating ungulate teeth archaeologically associated with Middle Palaeolithic (MP) assemblages enables one to obtain archaeologically significant absolute dates that exceed the maximum dating limit with AMS 14C. Without ESR date to confirm, bovid, and equid teeth, the archaeological and palaeontological significance of Petrića, a MP site near the Sićevo Gorge and Mali, Serbia, would have been low. Petrića’s marine-supported conglomerates yield a Chasian Mousterian, a Denticle Mousterian, and a blade-rich Gravettian industry in Layers 4, 5, and 2 respectively. Each layer had large mammalian faunas exploited in a mixed environment with temperate forest, rocky cliffs, and steps within walking distance. 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 significant dendritic U, > 50 enamel samples and microradiographically distinct components were measured by ESR. After early MP 4, the erosional event that eroded parts of Layer 4a before Layer 4’s deposition also saw fourteenth teeth. The Layer 4c/4b boundary correlated to Marine (Oxygen) Isotope Stage (MIS) 5e, while Layer 4c and its Neanderthal fossils dated at 105 - 9 ka (MIS 5c). Layer 4a and its iconoclastic bovid appears at 94 - 4 ka (MIS 5b). Correlating best with Dansgaard-Oeschger (DO) Event II, Las Cotté Cretaceous, a tooth from Layer 3, the youngest Mousterian deposits, represents one of the latest Middle Palaeolithic dates in the central Balkans, while the Gravettian tools in Layer 2 dated to late MIS 5. It is DO Event 6, the Donkemast Interstadial. This precessional occupation from 117 ka to 59 ka, among the longest in the central Balkans, is one of the few caves with MIS 6 deposits.

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

ESR DATING TEETH ASSOCIATED WITH THE MOUSTERIAN AND NEANDERTHAL FINDS AT PESTURINA, SERBIA

Abstract author(s): Blackwell, Julie (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) - Mihalovic, Dušan (Dept. of Archaeology, University of Belgrade) - Roksandic, Mirjana (Dept. of Archaeology, University of Belgrade) - Staubwasser et al., 2018. PNAS 115, 201808647.

Abstract format: Oral

Skeletal teeth from Neanderthal and early modern human deposits at Pešturina, Serbia, can be dated using electron spin resonance (ESR) techniques to provide proxy estimates for climatic conditions directly connected to some of the earliest human groups in Europe.

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

VARIEABILITY IN LARGE CANTS FROM DOLNÍ VESTONICE II, CZECH REPUBLIC: DOMESTICATION OR PLEISTOCENE ECOMORPHS?

Abstract author(s): Szalavza, Sandra (The Czech Academy of Sciences, Institute of Archeology, Brno, Centre for Palaeolithic and Palaeoanthropology Dolini/Vistonice) - Perri, Angela (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Department of Archaeology, Durham University) - Fowlser, Helen (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology) - Novák, Martin (The Czech Academy of Sciences, Institute of Archeology, Brno, Centre for Palaeolithic and Palaeoanthropology Dolini/Vistonice)

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 Sázelová, 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 (Garmepop et al., 2012), Bocherens et al., 2015). Yet, the infraspecific 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 Sázelová, 2016) suggests domesticated canids were not present here. Alternatively, it seems more likely that these remains simply represent various wolf morphotypes that developed over shorter periods, as biological responses to somewhat unique evolutionary pressures. The Czech Academy of Sciences foundation project no: 20-269049 and Czech national institutional support RVO: 68086798.


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

Abstract author(s): Dumitrascu, Valentin ("Vasile Pârvu" Institute of Archaeology, Bucharest) · Vasile, Ştefan (University of Bucharest)

Abstract format: Oral

The Buda paleolithic site was discovered in 1958 on a hilltop, in the northeast of Buda village (Bacău County), surveying the lower side of the Bistritsa 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 are mainly Gravettian, 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 (Pârvescu, 1996, confirmed by Ulftrauf et al., 2018). The bone and antler industry is almost absent, no considerable 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.

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

Abstract author(s): Bořivoj, Sona · Sázelová, Sandra · Šášeková, Soňa · Novák, Martin (The Czech Academy of Sciences, Institute of Archaeology, Brno, Centre for Paleolithic and Palaeoanthropology Dolní Věstonice)

Abstract format: Oral

The Pavlov I site was excavated by two researchers, B. Klíma in 1950-1970s and J. Svoboda in 2013-2015 (Klíma, 1954, Svobo-
da 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 morphological and biological material dispersed around this unit consists of different animal species such as wooly 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 Founda-
tion project no. 20-26904G "Hunters at a camp Reconstruction of spatial behavior at Moravian Gravettian sites" and the Czech national institutional support RVG: 68081758 - The Czech Academy of Sciences, Institute of Archaeology, Brno.


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

Abstract author(s): Jones, Jennifer · Marín-Arroyo, Ana B. (Grupo EVOADAPTA. Instituto Internacional de Investigaciones Prehistóricas de Cantabria. Universidad de Cantabria) · 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 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 refuge for the human populations and natural ecos-
systems during this period. In 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 de-
posits and rock art, mainly dating to the Upper Paleolithic. A review of the current research state about the subsistence strategies and the paleoenvironmental information of the available Solutrean and Magdalenian sites (Las Caldas, Las Casas, La Peña de Candamo and Caldas de Requena) is pre-

dented here. The preliminary results of our taphonomical and paleoarchaeological 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 paleoenviron-
mental information of the surrounding sites.

All the gathered information will allow to decide whether such 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 (pредoctoral research fellowship), the ERCSE (ERC Consolidator Grant-812999) and the Spanish Ministry of Science, Innovation and Universities (PGC2018-100010-B-I00).

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

Abstract author(s): Maschenko, Evgeny (Boryssyak Paleontological Institute Russian Academy of Science) · Vysokreskaya, Ekaterina (Institute of Geography Russian Academy of Science) · Gavrilov, Konstantin (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

The first evidence of M. primigenius seasonal migrations was obtained on the basis of the synthesis of data of Late Pleistocene paleo-
geomorphology of the Desna River valley and the mammoths remains on the Khoytovye-2 site (24960±400) 19-19 600±450 BP. The system of flat-bottom and through valleys (Dzouma 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 mam-
moths to the source of weathered chalk and marl as the mineral nutrition at the slopes bedding of the Desna valley. Modern elephants and
dinosaurs” to determine the 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 mammoth’s survival during winter. Thus, the Khoytovye-2 site is located to that part of the valley along which seasonal migra-
tion 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 Khoytovye-2 site allows us to interpret their as structural elements of a specific complex that formed in several stages and, apparently, had a sacrificial character for their. The structures were studied by RFBR projects no.18-09-00688 and 18-00-00542.

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ABSTRACT CONTENTS
13 MEGAMAMMALS LANDSCAPES DURING FIRST SOUTH AMERICAN PEOPLE (LATE PLEISTOCENE–EARLY HOLOCENE, ARGENTINA)

Abstract author(s): Lanata, Jose (CONICET) - Chickiroyan, Karina (CONICET-HGyPC) - Suárez, Gabriel (Universidad de Morón) - Teseis, Augusto (CONICET-MIN) - Moschini, Nadia (IDyP-CONICET) - Briones, Claudia (CONICET-UNAM) - Lanzénol, Sonia (IOIC-L-CONICET)

Abstract format: Oral

Environmental conditions vary due to extreme changes during the Late Pleistocene–Early Holocene (circa 20,000 to 8,200 cal BP) in South America. During this period two important biotic events took place: human dispersal and extinction of megafauna. The latter is based on the drivers behind this megafaunal extinction event versus 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 fluctuations and how Hominins were involved in this changing paleoecological dynamic.

This presentation is a second-wave of 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). Palaeontological: Species Numbers, quality of life and interactions amongst each other are being studied through the identification of different paleopathologies. Information is being collected especially in Luján location, giving the extensive record present there. Isotopes (Sr and δ15N): Ecology of the non-analogous species assemblies 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 model, and to compare datasets.

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

Abstract author(s): Britton, Kate (University of Aberdeen; Max Planck Institute for Evolutionary Anthropology) - Lu Corra, Maël (University of Warwick) - Benoit (University of Aberdeen) - 066, Steeve (Université Laval, Montreal) - Grimme, Vaughan (Memorial University, Newfoundland)

Abstract format: Oral

Our ability to reconstruct spatial movements and seasonal biologies of Pleistocene fauna has greatly improved with the development of isotopic techniques (e.g. 87Sr/86Sr) and high-resolution methods for understanding extinction processes, human dispersal and megamammal distributions. We are exploring approaches to both data generation and data analysis that are required. Here, focusing on reindeer/caribou as a case study, we present the methodological framework for an isotopic-based model which will allow the reconstruction of migratory movements of fauna from their intra-tooth data, the PleistoHERD model. Our model integrates intra-tooth and landscape isotopic 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. We use the collection of data generation and data analysis efforts. We are exploring the possibility of using a model to reconstruct past migratory routes across landscapes to assess the distribution of Pleistocene faunas.

Through the PleistoHERD model, we aim to understand the paleoecological patterns of past Pleistocene faunas, focusing on the palaeontological record, such as tooth enamel. However, in order to reconstruct past migratory routes across landscapes (paleoecological corridors), we require a more nuanced approach to both data generation and data analysis. Here, focusing on reindeer/caribou as a case study, we present the methodological framework for an isotopic-based model which will allow the reconstruction of migratory movements of fauna from their intra-tooth data, the PleistoHERD model. Our model integrates intra-tooth and landscape isotopic 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. We use the collection of data generation and data analysis efforts. We are exploring the possibility of using a model to reconstruct past migratory routes across landscapes to assess the distribution of Pleistocene faunas.

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

Abstract author(s): Šalávová, Sona - Sázelová, Sandra - Boriová, Soňa (The Czech Academy of Sciences, Institute of Archaeology, Brno, Centre for Paleolithic and Paleoanthropology Dolní Vestonice)

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-periods are formed within longer periodicity of several days. In order to study the individual life history, the microstructure of the dental hard tissues can provide a record of survival and environmental stress events such as malnutrition, wear or seasonal changes of resource availability (e.g. Hogg 2018, Kierdorf 2019).

The contribution deals with preparation and microscopic analysis of thin dental-slices from three mid-upper Paleolithic human dentitions from the Upper-Paleolithic Moravian region Dolní Vestonice - Prague. 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. 20-26094Z “Investigations on wild dog (Canis lupus) cranio-facial morphology” and the Czech national institutional support RVO: 68081758 - The Czech Academy of Sciences, Institute of Archaeology, Brno.


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 - Dorochevich, Vladimir (Laboratory of Phystiology, St. Petersburg) - Skinner, Anne (Dept of Chemistry, Williams College, Williamstown) - Brikstein, Joel - Babuomian, Shant ic - 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 corred its Neanderthal incisors, early Middle Paleolithic (MP) assemblages, detailed zooarchaeological analysis and palaeoecological analysis of Carpathian caves. This research explores novel paleoecological approaches towards gathering new evidence on the Neanderthal occupation at Matuzka Cave, Russia. This research is based on the following suspected 8.3 ka (MIS 5d) and 7.8 ka (MIS 5e) Neanderthal occupations within the cave. Our aim is to provide an accurate dating framework for Neanderthal occupation at Matuzka Cave, Russia, using ESR dating on teeth associated with early MP assemblages, and to test the interpretation of these occupations within the context of the Bassa Nova Culture, Russia. This research will contribute to a better understanding of the Neanderthal occupation at Matuzka Cave, Russia, and its implications for understanding the paleoecological and cultural context of the cave.

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


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. The contribution will discuss the importance of high-precision and accurate radiometric dating of European Neandertal, archaic, and modern human teeth from this Upper Paleolithic Middle Paleolithic transition site.

The contributions of these high-precision and accurate radiometric dating of European Neandertal, archaic, and modern human teeth from this Upper Paleolithic Middle Paleolithic transition site to our understanding of the Mesolithic and Neolithic in the Balkans will be discussed. The contribution will also discuss the importance of high-precision and accurate radiometric dating of European Neandertal, archaic, and modern human teeth from this Upper Paleolithic Middle Paleolithic transition site to our understanding of the Mesolithic and Neolithic in the Balkans.

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The contribution will also discuss the importance of high-precision and accurate radiometric dating of European Neandertal, archaic, and modern human teeth from this Upper Paleolithic Middle Paleolithic transition site to our understanding of the Mesolithic and Neolithic in the Balkans.
GENS NORMANNORUM - UNDERSTANDING NORMAN INTERACTIONS THROUGH MATERIAL CULTURE

Theme: 2. Network, 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 whom those whom they came into contact with. Consequently, through the various networks and routes of communication, ‘Norman’ material culture in England, for example, is quite different to that of the ‘Normans’ who 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 this 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 of what being a Norman meant? Where they really a well-defined group sharing a common language and culture?

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 government in 2015) 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 how surviving Britons is actually Norman, so influenced were the Normans by the cultures of others. The Romansque, for example, which is a feature on 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 Norman material culture, how do we tell a story of the Normans through objects?
Archaeology and Interdisciplinarity: The New Status Quo or the New Buzzword?

Abstract format: Oral

The recent introduction and development of new scientific techniques in archaeology has led to several original insights concerning the lives of prehistoric human populations, from migratory patterns and diseases in DNA 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 from 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 paradigm for 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 interdisciplin- ary “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 problems and concerns that affect the world in the 21st century.

In other words, “interdisciplinarity has no inherent meaning” to quote Julia 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.

References:


Three Facets of Interdisciplinarity: Power, Politics and Profit

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 also kept them apart. Yet, Deardorff suggested that this artificial partitioning of knowledge into disciplines affected our perceptions and limited our actions. Archaeology in the 1960s experienced disciplinary innocence, acceded by Clark in 1970, before paradigm change. The formation of many associated subdisciplines which relied on specialised knowledge brought from other scientific disciplines. However, Deardorff suggested that the disciplines of interdisciplinarity involves 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 all disciplines of interest, 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 it is in the school of geosciences at the University of Aberystwyth. 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.
Let’s talk about it. The Importance of Communication and Translation in Interdisciplinary Cooperation

Abstract author(s): van Helden, Daniël (University of Lancaster)
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 incomensurability, 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, interdisciplinary work 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.

Methodological Anarchism Against Interdisciplinaryity: Breaking Down Methodological Walls

Abstract author(s): Ribero, Artur (Christian-Albrechts-Universität)
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 is interdisciplinaryity in 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 future 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 primarily used 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.

Plants meet artifacts: developing interdisciplinary approaches to identify plant processing and use in archaeology [archaeology of wild plants]

Theme: 6. 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, Deny (Zinman Institute of Archaeology, University of Haifa) - Ibáñez, Juan José (Instituto Milà 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 micromains), biometric archaeologists (organic residue analyses) and researchers specializing 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, raw materials...), and contributions from all periods and geographical 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): Grama-Yaroslavsky, Iris - Bashavy, Katerina - Koporovsky, Maya (University of Haifa; Zinman Institute of Archaeology)
Abstract format: Oral

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

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

Abstract format: Oral

We investigated the variability in the use-wear polish from the reaping of cereals. By employing confocal microscopy, we have discovered some minor differences in the polish from the same species. We used these techniques to explore the different angles and positions at which the cereals were reaped. We found that this variability could be due to the 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.

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

Abstract author(s): Khalfair, Hermine - Ibanez, Juan (Consejo Superior de Investigaciones Científicas) - Jago on, Shenon (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 lacked unchanged for millennia. Currently, the dominant hypothesis to explain it is the “Bamboo Hypothesis.” Preliminary hunter-gatherers would have adapted to their environment, the tropical forest and manufactured more complex implements in a perishable material bamboo. Nevertheless, archaeological remains, use-wear and residues observed on stone tools show that several species have been used and used by the stone tool user. Therefore, we can hypothesize that the amplification 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.

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

Abstract author(s): Perna, Maria - Morta, Marta (Department of Archaeology and Anthropology, University of Social Sciences - 201705R 995, Instituto Mili de Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Hamon, Caroline (CNRS-UMR 8215 Trajectoires Maiton de l'archéologie, Nanterre cedex) - Remolins, Gerard (ReGiraRocs S.L. Research, Conservation and Dissemination, Cultural and Natural Heritage of the Pyrenees. Escalades-Engordany) - Mazzucco, Niccolò - Gibaja, Juan Francisco (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 201705R 995, Instituto Mili de 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 Marmota (Lake Bracciano in Italy, 5700-5300 cal BC) presents a range of ground stone tool assemblages, including flint and obsidian. Our study focuses on the use-wear analysis of the core and flake surfaces. We found that the use-wear patterns indicate the processing of cereals, including hulled barley and einkorn wheat. This indicates that the site was used for food processing during the Neolithic period.

THE EPPILAEOLITHIC-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 profound cultural 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 preparation and cooking techniques during the transition from pounding as the main food processing technique. We examine this variability in an experimental program of harvesting tools, using texture analysis and confocal microscopy in order to measure it. We conclude that important aspects of the characteristics of harvesting activities in the past can be unveiled using this methodology.

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

Abstract author(s): Althuy, 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) of reference collection. 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 diet 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.

CHARGED FOOD CRUST: EVIDENCE OF FOOD PROCESSING, DIET, AND RADIONUCLIDE DATING

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

Abstract format: Oral

Charged 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 animals 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 more 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 (if not most) of the proteins and amino acids present. Though these methods have been identified with very limited success, this presentation brings together the results of our analyses, discussing their relevance to better understanding food, diet, and radiocarbon dating.

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

Abstract author(s): Gonzalez Gavaretos, 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
WHAT’S IN THE COOKING POTS? - SEM AND LIPID ANALYSES ON FOODCRUSTS FROM THE EARLY NEOLITHIC IN THE NETHERLANDS

Abstract author(s): Kubik-Martens, Lucy (BIAX Consult, Biological Archaeology & Environmental Reconstruction, Zandam) - Demirsc, Ozge (Groningen Institute of Archaeology, Groningen) - Lucquin, Alexandro (Biocart, 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 (4100-4000 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 not 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 Culture.

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

Abstract author(s): Pedersen, Patrick - Arranz-Otaegui, Amaia - Jørgensen-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 (4.14-14.1 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 form 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 Burq, 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 firepine 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 archaeo-botanical remains found at Shubayqa 1.

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 Artifacts, Department of Classics, Sapientia University of Rome) - Portillo Ramirez, Marta (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017/2018, Instituto Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Gómez Baz, Anna - Molist Montaña, Miquel (Department of Prehistory, Autonomous University of Barcelona) - Le Miere, Maria (Associa Researcher, Archæont, CNR-Institut Universitè Lyon 2). Forta, Vanessa - Lemorki, Cristina (LTFAPA, Laboratory of Technological and Functional Analyses of Prehistoric Artifacts, Department of Classics, Sapientia 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 results. In turn, phytolith results indicated the nature of the plant material adhered to the vessel surfaces which is dominated by Poaceae grasses. Multicellular or anatomical connected phytoliths from the husks of wheat and barley were common in these assemblies. 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.

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

Abstract author(s): Musuabab, Maria (Facultad de Humanidades y Ciencias Sociales, Universidad Nacional de Jujuy; IndiA - CONICET, UNJu, UNT, Gov. de Jujuy) - Scaro, Agustina (INEODA - 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 consumption 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 settings 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 Huaquía. 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 Huaquía. Use-wear analysis were 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 maize (Zea mays), Quinoa (Quinoa s. L.) 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 aot and abrasive processes point out to the processing of stew-like foodstuffs.

NOTE: AN ANCIENT RECIPE IN ANDINE KITCHENS. EXPERIMENTAL AND TAPHONOMIC APPROACH

Abstract author(s): Musuabab, Maria (Facultad de Humanidades y Ciencias Sociales, Universidad Nacional de Jujuy; IndiA - CONICET, UNJu, UNT, Gov. de Jujuy) - Scaro, Agustina (INEODA - 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 and consumption practices during the Inca period were investigated. The analysis of charred plant remains recovered in Pucara de Volcán and dental calculus of two individuals buried in Esquina de Huaquía. Use-wear analysis were 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), Quinoa (Quinoa s. L.) 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 aot and abrasive processes point out to the processing of stew-like foodstuffs.
14 APPROACH TO PLANT-CRAFTS TECHNIQUES FROM THE BASAL MAT IMPRINTS OF BRONZE AGE CERAMICS IN THE NORTH-EAST OF IBERIAN PENINSULA

Abstract author(s): Pięk, Rafał - Bodoganick, Igor (Universitat Autonoma de Barcelona, Departament de Prehistòria) - Homs, Anna (Independent researcher) - López-Bultó, Oriol (Universitat Autonoma de Barcelona, Departament de Prehistòria) - Palomo Pérez, Antoni (Museu d’Arqueologia de Catalunya) - Romero-Brugués, Susana - Tarruq, Evidencia (Universitat Autonoma 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 basins 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 well-preserved 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 chronological periods 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 techniques of Cova Fonda (Salomó), Cova de Valldama (Abinyana), Cova del Fornic (Os de Balaguer) and Banyas de la Mora (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.

15 USE OF PLANTS BY THE FUNNEL BEAKER CULTURE COMMUNITIES IN POLAND

Abstract author(s): Stobiecki-Tabaka, Iwona - Reniewicz, Joanna (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznan)

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 sedentary type from Poland. We selected materials, each time precisely related to the archaeological context, such as macroscopic plant remains, fragments of ceramic vessels and basins containing plant imprints, mineralized plant tissues chosen 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, procurement, and processing. A particularly interesting was to learn the techniques of ceramic vessel production in terms of the specific authorship and admi Whistle 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.

16 COMBINING USE-WEAR AND RESIDUE ANALYSES OF GRINDING STONES AND EXPERIMENTAL STUDIES TO DETERMINE PLANT USE AT EARLY NEOLITHIC GÖBEKLI TEPÊ

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 slab/bowls, handstones, 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.

82 COLLABORATIVE SYNTHESIS: THE EAA-SAA HUMAN MIGRATION PROJECTS

Theme: Sustainable archaeology and heritage in an unsustainable world

Organisers: Altschul, Jeff (Coalition for Archaeological Synthesis; SIR 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 (CoAS) 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 migrations. 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 impli cated in the success of the incorporation of migrant 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.

ABSTRACT 1

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

Abstract author(s): Atschul, Jeff (SIR Foundation; Coalition for Archaeological Synthesis)

Abstract format: Oral

In 2019, the Coalition for Archaeological Synthesis (CoAS) 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 CoAS, which uses a model of collaborative synthesis that relies on face-to-face interaction by small, diverse groups of experts to provide evidence-based insights that inform issues facing modern society. CoAS 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 CoAS 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.

ABSTRACT 2

CLIMATE MIGRANTS OF THE PAST, PRESENT, AND FUTURE

Abstract author(s): Aildenforfer, Mark (University of California, Merced) - Bird, Douglas - Douglas, Krista (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 have 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 context of migrations and the ways in which past decisions have affected modern outcomes. Our project, one of the three proposals initiated by the 2019 CoAS 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 climate and environmental conditions. Indigenous, and descendant communities 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 work 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): Ailon, Elke (University College Dublin, Arizona State University) - Ammit, Ian - Bickley, Penny (University of York) - Ivanova, Elena (University of Exeter) - Niccolucci, Franco (PIN) - Ortman, Scott (University of Colorado Boulder) - Scaffidi, Beth (Arizona State University)

Abstract format: Oral

What role 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 biocultural isotopic and historical census data into a coherent picture of mobility in the past and a vast data aggregators such as tDAR in the United States and ARDINE 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 robustness), 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 long-term 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): Keith, Keith (Arizona State University) - 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 of energy and ideas of engaged archaeologists across the globe, but also leadership, funding, and organizational infrastructure. The Coalition for Archaeological Synthesis (CfAS) is one of collaboration and engaging individuals and associated collective capacities are being leveraged in the pursuit of collaborative synthesis that addresses contemporary social and environmental challenges. The 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 Szeppő-Yamnaya people, the Celts and the Romans to the so-called Migration period. Geographical factors (Lengyel, Gepida, Suebic etc. groups), Central Asian people such as the Huns, Sarmatians, Asians, Bulgarian Turks and eventually, the Hungarian tribes, already having been a mixture of Uril-ian, Finno-Ugrian 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 wartimes. 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, Terezita (Statistical Research, Inc.) - Watkins, Joe (Society for American Archaeology) - Cria-do-Bande, Filipa (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: 6. 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 traditionally 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 past. Is colonial theory one of the keys for a more balanced understanding of post-Islamicate societies, for instance in Illyria and Sicily? How can we address archaeologically the presence of significant crypto-Islamic groups in Christian-dominated areas? What is an 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.

ABSTRACT

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

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

Abstract format: Oral

On the occasion of the fourth time of this three-time successful session of EAA, I will present some thoughts on the basic ideas on which the group has converged. 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 blindered us to other questions that need to be asked. One of them would be of the form of an idea of 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 ‘colonise’ Islam by distilling its European parts.

In this paper I aim to explore this question and to offer some points of discussion to stimulate debate.
ISLAMIC ARCHAEOLOGY OF THE STEPPE NOMADS: THE ELEPHANT IN THE ROOM OR THE ZONE OF SILENCE?

Abstract author(s): Shingray, Irena (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, political, academic, and practices 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 these matters. I will discuss such concepts as “otherness”, “backwardness”, “religious visitations”, and the nomadic “yoke” and “bul- wark” in relation to these people, and discuss how this treatment of these 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 recontextualization of nomadic material culture has the power to break that silence.

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 extant 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 mobilities of humans and materials as an intrinsically social process.

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 new 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 ‘Abbasid 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 a self-contained Viking Age, while also challenging scholars to present Viking violence as conditioned but not caused by developments in the Islamicate world.

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

Abstract author(s): Olivo-Busom, Julià (Autonomous University of Barcelona)
Abstract format: Oral

Despite a lively iconographic debate focused on the new population structures and movements that both the Islamic conquest of the 9th century and the posterior Feudal conquest of the 11th century caused in Šar al-Andalus, the osteological registry remains mainly unexplored. This lack of research is not caused by a lack of materials, as many 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 be- gan 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. Šar 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 its 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 Šar 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.

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

Abstract author(s): García-Conterrero Ruiz, Guillermo (University of Granada) - Robkowska, Marián (Institute of Archaeology and Ethnology - Polish Academy of Science) - Melisca Dueño, Antonio (University of Granada) - Herrlich, Tomasz (Institute of Archaeology and Ethnology - Polish Academy of Science) - Martínez Álvarez, Cristina (University of Granada) - Filipoñiak, Wojciech - Koka, 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 Madinat Iblira, 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 Madinat Iblira—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 as 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.

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

Abstract author(s): Eroza, Jorge (Departamento de Prehistoria, Arqueología, Universidad de Murcia) - González, José - Haber, María - Hernández, Alicia - Dalm, Mireia - Molina, Isabel - Muñoz, María - Martínez Rodríguez, Antonio - Balas, 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 Afro-Eurasian arable, partially unearthed in the northeastern area of the Andalusián city of Madinat Murisiya (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 ‘tunq’ have been identified, which proves the economic importance of this ‘arabat’. 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 50 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 ca.). The first bioarchaeological results obtained through organic residue analysis, zooarchaeology, palaeoecology, palynology, macro-morphology, radiocarbon and isotopic analysis, are being compared with the results obtained from textual 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.

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

Abstract author(s): Smith, Laurence - Taia, Shada (McDonald Institute, University of Cambridge; Wolfson College, University of Cambridge) - Phillips, Jackie (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 part 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, historical and ethnographic evidence will be used to consider the following questions:

1. Evidence for the source or sources of the origin of these items.
2. How such material moved from the place of origin to Suakin, concentrating on the role(s) of merchants, nomads and pilgrims.
9

**ISLAMIZATION AT THE URBAN SITE OF TATAR TUP AND ZMEISKY BURIAL GROUND, NORTH OSETIA-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 archaeological complex that includes the urban site of Tatar Tup (Upper Degvda) and the nearby Zmeisky burial ground—both located at the “Eikhovat Gates” in the Republic of North Ossetia-Alania. During the period 1957-1960, archaeologists V.A. Kuznetsov and O.V. Mikolasovich excavated Tatar Tup and discovered three minarets and two mosques: the main city mosque and a smaller one. The famous Tatar Tup minaret was unfortunately destroyed in 1961 as a result of an unsuccessful restoration attempt. During the excavations of the city-mosque, two burial-grounds 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. Filatov investigated three Muslim graves constructed with brick and stone at Zmeisky burial ground. More recent excavations there led by M.A. Bakhachev 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, 95 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, the evidence shows that some of the Alans who resided at Tatar Tup 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 Tatar Tup 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):** Kaval, 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 Golden Khan Empire in the 11th 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 80 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 Kakhayla (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):** Bilasiev, 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 territories 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. The interconnections present an important phenomenon in the history of the 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. (Slavj, 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 (Plazmany Peter 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, whereas 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 artifacts 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 long excavations that took place in these 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 personal 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):** Belov, 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 blue relief ornamentation. Its surface could be a variety of coating: simple red or white clay, transparent greenish glass, and, starting from the 1650’s, blue 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 tiles as the basic element of the facade. Secondly, Moscow had the close contacts with the Islamic world of the 14th-17th c. However, the last but not the least, the ornaments of the Moscow tiles and of the carved stone decoration were evidently oriental. It was one common place of the Russian literature of the mid 19th c. to mention a tile as one of the oriental elements. Consequently the different position was announced, that the tiles were brought to Moscow by the architects from Italy and later from the Far East. 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): Vybornyuk, 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, scallop 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. Gold and silver goods acquired by the Cossacks in this way diverged from the Ukrainian settlements and farms. Elements of oriental motifs, borrowed from onomastics, fabrics, ceramic products, decorations, were processed by local craftsmen, simplified according to the aesthetic needs of the customer and the professional qualities of the craftsmen. They often received a synthesis of elements of eastern and western motifs. So, during the twentieth-century excavations in Belgorod-Dnestrov, some furnace tiles were found which relieved ornament combined the design features of Western European tiles with the traditional Islamic talis-

mantic symbols. The main elements of ornamental motifs in Ukrainian tiles were: ornamental patterns, rossettes, acanthus and palmettes. 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 motifs with flowers. Thus, ornamental ornamental motifs on Ukrainian tiles are most common in the Ottoman period.

FEATURES OF THE ISLAMIC GLASS FROM THE GOLDEN HORSE

Abstract author(s): Vulakova, Svetlana (Kazan Federal University)

Abstract format: Poster

First of all, it should be borne in mind that Islamic glass, which is one of the most eminent components of Islamic production, art, and Islamic archaeology, 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 Middle Ages, 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 19th–20th centuries, the area of distribution of Islamic glass in the 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, allows 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.18-09-03016A.

OTTOMAN ARCHAEOLOGY IN FORMER KÜSTENDJE (CONSTANȚA, ROMÂNIA)

Abstract author(s): Motolea, Aulăet- Potâmbică, Tiberiu (Museum of National History and Archaeology Constanța) - Stancu, 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 18th 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 (Dana). This type of Dana is commonly found in Con-
stanta 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

restoration, leaving out all the available information, and establishing exact analogies.

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

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

Organisers: Fernández-Crespo, Teresa (CNRS, LAMEA - UMR 7269) - Diaz-Zorita Bonilla, Marta (Tübingen Universität)

Abstract format: Regular session

Identifying and understanding the rationale and the mechanisms behind inequality in Prehistory is a major challenge in archaeo-

logical research. The transition from hunting and gathering to farming and herding economies has long been linked to genera-

tion of substantial and long-lasting social and economic inequalities. However, the European record rarely shows robust archaeo-

logical evidence for horizontal (among individuals or households) and 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 encou-

aged. Reports of negative results are also welcome.

IOTIVES AND IVORY POSSIBILITIES AND LIMITATIONS FOR CONSERVATION OF IVORY FROM ARCHAEOLOGICAL RECORD

Abstract author(s): Lucila Izquiel, Miniam (University of the Basque Country - UPV/EHU), Eberhard Karls Universität Tübingen - Diaz-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 con-

sumes 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 northern Spain but also in Portugal. Particularly in the Guadalquivir valley at the Chatelote site of Valencia-Castillejos (Seville, Spain). At this site, almost 9,9 kg of ivory were discovered in different sectors. They were mainly docu-

mented 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 anal-

ysis of stable isotopes of carbon and nitrogen ([13C] and [15N]) applied to ivory, with the main focus for its conservation (diagnosis).

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In this paper we will present the intra-site results of the elemental (%C, %N and %S) and isotopic analysis of Valencina-Castilleja.

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In this paper we will present the intra-site results of the elemental (%C, %N and %S) and isotopic analysis of Valencina-Castilleja.
3 ISOTOPIC ANALYSIS OF DIET AND MOBILITY FROM HUMAN REMAINS BETWEEN THE CHALCOLITHIC AND IRON AGE IN SOUTH PORTUGAL

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

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 understand better our understanding of human communities. Although diet and mobility could be inferred from the stable isotopes of human remains, our goal is to use the stable isotopes of plants to examine strontium, oxygen, nitrogen and carbon isotope ratios in dental enamel and bone collagen from individuals. The results reveal an isotopic discrimination of the diet, and so address many questions, among others, the social distinction (age, sex or status) and mobility patterns within and between these communities during the Iron Age period in particular geographic area of Portugal (Baixo Alentejo, Portas do Arco, Alentejo interior).

4 USING FAUNAL δ15N COMPOSITIONS TO DISTINGUISH BETWEEN DIFFERENT SOCIAL GROUPS AT EARLY IRON AGE ZAGORA, ANDROS, GREECE

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

Abstract format: Oral

The δ15N composition of plants is suggestive of the conditions under which they developed. Elevated δ15N 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 availability. In more 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 with little and with different soil would have a higher δ15N 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 δ15N composition between two of the three main excavated areas, D and E, with the A area producing caprines with the highest δ15N compositions. The houses in the A 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 similar architectural remains in the J area which has yet to produce faunal samples for isotopic analysis, 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-ISOTOPE APPROACH FOR EXPLORING MOBILITY AND SOCIETY IN IRON AGE BRITAIN

Abstract author(s): Hamilton, Derek (SUECC, 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 BCE) – 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. The purpose is to examine strontium, oxygen, nitrogen and carbon isotope ratios in human remains (dental enamel and bone collagen), and to 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 (CANTARY 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 sixteenth century AD. The archaeological record points towards a mainly shepherding society, but to this point, few research have been made about possible climate 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 93 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: Did archaeology in Europeorphic to the final Pleistocene and Holocene: cross-cultural and disciplinary syntheses

Organisers: Hussain, Shumon (Department of Archaeology and Heritage Studies, Aarhus University) - Stafstrøm, Danish (Archaeological Museum Krakow) - Ried, 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 are only beginning to be understood, however. In recent years, our knowledge of the migration and frequency of climate change across this period has increased dramatically, as has our awareness of opportunities and challenges 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 currently hindered by the inherent complexities of the dataset and the need for transparency in relation to the traditionally employed cultural taxonomic units. Although it is typically argued that the homogeneous cultural topog- raphy seemingly diagnostic of the Pleistocene-Holocene transition signifies regional differentiation and more and more refined 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-specific 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 across the Final Palaeolithic-early Mesolithic boundary, including lists of key sites, diagnostic artefact classes, revised chronologies, numerical dates and paleoenvironmental proxy records.

ABSTRACTS

INTRODUCTION: ATTEMPTING A NEW SYNTHESIS OF LITHIC VARIABILITY AND CULTURAL GEOGRAPHY AT THE FINAL PALEOLITHIC-EARLY MESOLITHIC INTERFACEx

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 palaeoecogenics. 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 utilise archaeological data – often box-ready and uncritically accepted by archaeologists and other researchers, in particular those in the humanities and social sciences.

We argue here that the Pleistocene-Holocene transition, often considered a major ecological 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 empiricilabs of the supposedly complex cultural geography of the Final Palaeolithic and Early Mesolithic from a pan-European perspective and to ask whether we can re-contextualize and re-analyze the way individual artifacts were used and the way materials were processed in the past. 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 technique 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 marked.

CHRONOCULTURAL DIVERSITY AT THE BRIDGE OF THE LATE PLEISTOCENE AND THE EARLY HOLOCENE IN THE KRAKÓW AREA (SOUTHERN POLAND)
Abstract author(s): Stefaniuk, 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 are distinctive for the Late Palaeolithic. The area is a part of the North European Plain and its archaeological and palaeontological spectrum of archaeological entities defined within the Alfold-Borreal zone varies. However, an investigation of the local cultural-chronological 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 relative 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 Borreal period. This assumption is mainly based on few radiocarbon dates taken from lithic assemblages. However, other arguments like technocultural shifts, raw material economy and spatial organisation modifications, support this hypothesis. Arguments for such reasoning will be presented and discussed.

CURRENT STATE AND FUTURE OF PALAEOLITHIC RESEARCH IN ISTRIA, CROATIA
Abstract author(s): Jarkovčić, Ivor - Novak, Mario (Institute for Anthropological Research)
Abstract format: Oral

Recent decades saw a rise in research on the Upper Palaeolithic sites in Istria, mainly due to a number of topical projects (e.g. Palaeo- lithic and Mesolithic sites in the northern Adriatic”, 2003-2008, and “Archaeological investigations into the Late Pleistocene and Early Holocene of the Lim Channel, Istria (ARCHALEUM)” 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 Palaeolithic 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 Adriaic 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-2019-04-7921). 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 fauna and human communities affected each other and contact zones of late Palaeolithic 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.

RE-ASSESSING THE LITHIC VARIABILITY AND CULTURAL GEOGRAPHY OF FINAL PALAEOLITHIC AND EARLY MESOLITHIC EUROPE
Abstract author(s): Matzig, David - Hussain, Shumon - Redo, 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 secondary data sources and an epistemologically informed approach which is often missing and only partially 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 analyses on lithic point-types from selected key-sites across 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 archaological practice.

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

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

**Organisers:** Ødegaard, Maria (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 topographical evidence confirms the importance of beacons and lookout points 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 – 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? Does an archaeology of military communications give insights into the social worlds of past peoples, how does the routinisation of war and the threat of attack affect people and their institutions? Contributions are sought from scholars working in archaeology, history, topology, 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 personal); places, earthworks, and power centres, etc.; and the sociopolitical dimensions of civil defence and its impacts on people.

**Abstracts**

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

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

**Abstract format:** Oral

A range of written, archaeological and topographical evidence confirms the importance of beacons and lookout points 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, 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 Nordfjord 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 demarcated 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 located on a central agricultural territory of the Tegean city-state. Early Greek historical sources attest that signaling beacons (phraktibía) in the form of fires lit on mountain tops were used to transmit messages effectively over large distances. In the tragedy Agamammion Aeschylus thus describes how the message of the fall of Troy was transmitted from the coast of Asia Minor to Argos in the Peloponnesus. The watchtowers at Tegea probably functioned as beacons from where signals were emitted. They must accordingly have been interconnected with networks of beacon on mountain tops further away from the territory. It is also documented how rural watchtowers and border fortresses served as military obser-

**3 THE ROLE OF FORTESSSES 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 Balken 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 any more, 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, 45 fortifications were reconstructed and 70 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 piligrimage, 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):** Bortaud, Alexandre (Aixenosis, University Bordeaux Montaigne)

**Abstract format:** Oral

The communication tools left very few traces in the archaeological records because most of them are related to sound, visual or verbal sign which are schema 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 Prehistoric 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 organisation 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 arm 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 lookout points 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 Aincly 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-
tish, Irish and English coastlines to the north, west and east, and rather less so of Wales to the south. Psychological communication has inevitably played a role in the island’s history throughout time both from the neighbouring shores and further afield.

Recently, a promontory fortress 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 this has been extended 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 various statutory provisions for the guarding of the coastline, the mustering of larger forces in times of need, and the logistical practicalities of policing a long and varied coastline, at times apparently defensible and at other times more vulnerable, where topography and access can both help and hinder those on shore and at sea.

7 GAME OF THRONES OF EARLY VIKING AGE DENMARK? - THE VIKING ARISTOCRATIC SITE AT ERRITSØ

**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. In addition, independent written sources indicate an important strategic meaning to this site.

Archaeological investigations over the past years by the Veja Museums have added significant new knowledge and dates that are more precise from this site. In concert, they underpin with newly discovered sunken hut (Liberhaußen) that it was an extraordinary elite residence with significant craft activity possibly already existing there. The year 800, this newly discovered sunken hut, where the hall 50 meters long, three-phased hall found 60 metres to the east supports the assumption of a long site continuity. In this lecture we will reveal new, absolute dates and find that support the great hall’s earlier phase close-by. Building-technical comparisons with identical sites of elite residences in nearby Zealand towards the east, Tisse and Løgje and absolute dates support this contention.

As well, 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 lands of the Danes in order to punish the Danish kings.

8 THE BEACONS OF KNOWLEDGE - THE DISCOURSE OF SCANDINAVIAN BEACON SYSTEMS

**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. Especially 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 medieval town of Borgund, I will show what methods can identify signaling sites on the west coast of Norway, and how the sites can be related to time and space, with the combination of multidisciplinary 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 rationalistic view, related to the Viking-early medieval period and the developing of the levy organisation, even with the lack of archaeological data supporting this.

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

**Abstract format:** Oral

The famous Viking Age trading site of Hedeby is situated at the inner and 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 caves create the impression of natural harbours. In other words, the Schlei seems to have been a perfect scene for the implementation of a maritime defence system in order to protect Hedeby.

Nevertheless, so far the archaeological evidence of the form of sea barrages and warrior graves allows only selective insights into defensive structures and military organisation. However, by taking into account the topographical 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 in. In addition to that, a crucial part for the interpretation is taken by GIS-visualised 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.

10 AN ARCHAEOLOGICAL EXPERIMENT IN LARGE SCALE. THE MILITARY COMMUNICATION OF THE VIKING AGE REESTABLISHED

**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 900-1100 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 toponymy and topography and possible internal connections identified by visual 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 fires (in rocks) 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 50 km.

The project provided important knowledge and did at the same time make a unique dissemination and understanding of a total foss. Viking Age cultural landscapes. By involving of school classes and other local stakeholders a large local involvement was established.

The results of the project underline 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 is multifaceted approach made it possible to get a sense of the military organization in a diachronic, regional perspective.

11 BEACONS AT THE TRØNDELAG COAST, NORWAY – SEA MARKS OR RELICTS OF A SCANDINAVIAN IRON AGE MILITARY COMMUNICATION?

**Abstract format:** Oral

The paper takes its 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 Frostatething law as part of the landtang institution, and are thus assumed to have existed in the Trondelag district since the 10th century AD. However, the lighting of fires on high places or hills as part of a signaling 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, 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 conulation 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.
12 CARDONA’S CASTLESCAPE (BARCELONA): ANOTHER APPROACH
Abstract author(s): Pacorro Picó, Aníosa (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 valuable 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 lookout posts, 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 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 five years, we will also review its castlescape, specially from the western road that led to the town. The main target is to survey and to report the evidence, through the topographical and some historical evidence, the 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.

13 PATHS AND VISIBILITY BETWEEN THE CHRISTIAN MILITARY POSTS AND THE FORTRESS OF ALCALA LA VIEJA (SPAIN): UNDERSTANDING A MEDIEVAL SIEGE
Abstract author(s): Ramírez 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 paper offers a new approach to filling those gaps with the narrative sources that really did happen in 1118, when the Christian forces attacked the castle—in 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.

14 TURNING PERIMETERS INSIDE OUT: LOOKOUTS AND BEACONS IN THE STRAIT OF GIBRALTAR
CULTURAL FRONTIER AREA, C. 1350 - C. 1690
Abstract author(s): Ebd, Martin Malcolm (Portuguese Studies Review; Bayeovf 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 the Portuguese, and post-1682/1684 urban and open-field defensive structures in the greater Bay of Tangier area, with selected extensions now encompassing for comparative purposes Asha (Arzalca) 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 documents, chronicles and other narrative sources (including military memoirs), historical topographic and toponymic evidence, satellite imagery, aerial photography, and cone-ground verification, focuses on known, confirmed, or surmised locations of respective Moroccan and Portuguese/Iberian 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 summarized described in the existing literature, but a systematic survey, in a context of historical landscape analysis, is currently not available. Likewise, computer-modified digital terrain models (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/Iberian colonial port enclaves and Moroccan-held territorial hubs). The paper explores the evolving visibility 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.

ABSTRACTS

1 CARAVAN ANIMALS: DISTRIBUTION OF WEALTH AND DISEASE
Abstract author(s): Franovicic, 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 network. 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 the 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.

2 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 Bakhchisarai, 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 wares 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 how Islamic glazes truly emerged, 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.
A COMPARISON OF THE ROLE OF RELIGION IN THE DEVELOPMENT OF URBAN PLACES AROUND THE NORTH SEA AND IN JAPAN

Abstract author(s): Hutchesson, Andrew (University of East Anglia; Sainsbury Institute for the Study of Japanese Arts and Culture); Croucher, Karina (University of Bradford)

Abstract format: Oral

During the 6th to 10th centuries in northern Europe, around the North Sea, and in Japan, two major religious phenomena, Christianity and Buddhism, played a perhaps critical role in the development of urban places. Institutions of monasticism and kingship interacted to implant institutional 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 ecclesiastical ideal of a city, perhaps in part based on ideas expressed within Augustine’s City of God, the reality of which is often misunderstood. We can also see around the North Sea that trading settlements develop into urban layouts. Many of these sites have the term ‘city’ incorporated in the place-name. These seem to be separate from the ecclesiastical centres. With conversion to Christianity large-scale burial monuments, like those at Gamla Uppsal 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 consistent, 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 500-1100, 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.

THE DZHETYASAR CULTURE - STATE FORMATION ON THE IMPERIAL PERIPHERY

Abstract author(s): Hoppal, Krzysztof (MTA-ELTE-SZTE Silk Road Research Group)

Abstract format: Oral

In Antiquity, the Silk Roads (Sea and Road) were central to the internal and external exchange of ideas, objects, and ideas from different parts of the world. The Dzhetyasar culture is a part of this network 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 focuses. Such unevenness of information requires meticulous (re)-interpretation and systematic review of the material evidence.

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 Roads (Sea and Road), and highlights their diverse roles in networks of Silk Roads (Sea and Road) communities.

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 - T oraskar, 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 internationally as well as local and regional. One of the chief ports of the Korkan 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. This data we will shed a new light on how people living in Sopara used the landscape and interacted with it, 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.

THE INTEGRAL ROLE OF AKSUM IN ANCIENT AFRO-EURASIAN TRADE NETWORKS: A NEW ARCHAEOLOGICAL ANALYSIS IN PROGRESS

Abstract author(s): van Aarde, 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 placed to connection during this period between the Mediterranean region, via the Indian Subcontinent, to China. However, as new archaeological finds show, East-African trade centres 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 centres was the Aksum kingdom (current-day Ethiopia and Eritrea), with its major port of Adulis. Aksum functioned as physical crossroads 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 (Gujrat). By using this transregional approach to chart out exchange routes and nodal points in the networks based on archaeological material rather than 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.

TAMBO 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. 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.

ALL ROADS LEAD TO THE EAST? INTERPRETING ROMAN OBJECTS DISCOVERED ALONG THE EASTERNMOST SECTIONS OF THE SILK ROADS

Abstract author(s): Hoppal, Krzysztof (MTA-ELTE-SZTE Silk Road Research Group)

Abstract format: Oral

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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 focuses. Such unevenness of information requires meticulous (re)-interpretation and systematic review of the material evidence.

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BLOODY SHAME!

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FUEL FROM THE PORT: CHARCOAL ANALYSIS AND ARCHIVAL DOCUMENTS TO STUDY THE WOOD FUEL SUPPLY IN BARCELONA (14TH-18TH CENTURIES)

Abstract author(s): Blanco, Sabrina (Instituto Català de Paleoecologia Humana i Evolució Social - IPHES, Tarragona; Departamento de los Bienes Cultural, Universitat de les Glòries Catalanes) - Soler-Boix, Miquel (Departament de Prehistòria, Universitat de València) - Casas, Angel (Institut Catalá de Paleoecologia Humana i Evolució Social - IPHES, Tarragona)

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 fuel), it caused pressure on the environment. Despite being such a raw material for cities, wood fuel economy received little detailed attention in archaeology, even less when considering historical chronologies. In this framework, recent anthropological samplings in El Born Market archaeological site, located in the centre of Barcelona (Catalunya, Spain) near the ancient port, have been carried out, allowing to shed light on the topic. The aim of this work is to analyse, quantitatively and qualitatively, 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, this other, this informs raw material have been investigated by the analysis of the Post-Medieval registers of the “Port anchoring right” (Dock of Santa Coloma) in Tarragona. 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 charcoal 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.

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-Maroño Fernández, Paloma (Saxo Institute, Copenhagen University; The Globe Institute, Copenhagen University) - Vidal, Todd (Department of Geoscience and Natural Resource Management, University of Copenhagen) - Barnes, Christopher (The Globe Institute, Copenhagen University) - Daly, Anthea (Saxo Institute, Copenhagen University)

Abstract format: Oral

Timber is 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 this 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 falling 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 the precise geographical origins of the oaks. The application of Sr isotopic analysis and aDNA on timbers 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).

WOOD RESOURCES IN THE EASTERN SETTLEMENT OF NORSE GREENLAND

Abstract author(s): Gubmundsdottir, Lisabet (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, Eystribyggd (Eastern Settlement) in the far southwest Greenland and Vestribyggd (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 Vestribyggd, and around four times that in Eystribyggd. The settlements eventually declined and were abandoned, the Vestribyggd in the 14th century and Eystribyggd 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 artefacts from sites in the North Atlantic has shown that the Norse relied heavily on driftwood. Written sources suggest that the Norse Greenlanders obtained driftwood from an area called Norduræs, which is thought to have been in current day Disko Bay area. The distance from Eystribyggd to Norduræs 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.

SR ISOTOPIC ANALYSIS OF CHARRIED BARLEY GRAINS FROM ICELAND AND WESTERN NORWAY: PRELIMINARY RESULTS

Abstract author(s): Mooney, Dawn Elise (Museum of Archaeology, University of Stavanger) - Gubmundsdottir, Lisabet (University of Iceland) - Andreasen, 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 evidence provide evidence for past arable agriculture. However, the extent of cereal cultivation is not clearly defined in the Viking Age and early Medieval period has been the subject of much debate. Dendrochronologically dated 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, suggesting that it may have been grown in Iceland. However, it is impossible to be certain of this from the archaeobotanical evidence alone. With this in mind, stroniuim isotope analysis (87Sr/86Sr) was conducted on charred barley grains from Viking Age sites at Láskjarvatn in Reykjávik, Iceland and Sandavatn, Heland and Bjarkur in western Norway, in order to assess the potential of differentiating between archeologically defined grains from these sites 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.

NEW PLANTS IN GREEK-ROMAN EGYPT: THE CASE OF MYRTLE (MYRTUS COMMUNIS L.)

Abstract author(s): Andreausi, 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 rules, 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 newly 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 wines and perfumes. We conclude that today the most important 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 Ciar Far- dens collection. As much attention as is possible is paid to the contexts of the finds in order to understand the importance of this new data. Importantly, it will also be placed on the results of several other studies. Although an Egyptian name for myrtle does not seem to exist, Greek literature clearly mentions the myrtus and its cultivation. The interpretation 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 analyses of the vegetal material in order to better understand their provenance and relationship with other myrtle populations in the Mediterranean.

THE ROMAN “HEDGEHOO-SKIN-INDUSTRY”: PROCUREMENT, USES, COMMERCE, BREEDING, ETC.

Abstract author(s): Messieux, Nicolas (Independent researcher)
Abstract format: Oral
Different species of Hedgehogs (Erinaceoidea) all have in common the spines on their dorsal face. They can, thanks to a special mus- cle, 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 cardio and had quite an economical importance. They were protected by monopolies and decrees and it seems, complaints about skin “froger-ies” 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 were the “fraud” skins or “frauds” (ill explained)? Did a possible over-exploitation led to (local) extinction? Were other animals or species of hedgehogs used: e.g. 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 possible domestication of the Roman times. 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 hypothesis and models about humans-hedgehog relations in Roman times.

BEYOND CAVE ARCHAEOLOGY: INTERDISCIPLINARY APPROACHES TO HUMAN-CAVE INTERACTION IN EUROPE

Theme: 5. Theories and methods in archaeology: interactions between disciplines
Organisers: Trimmer, Konstantinos (Department of Anthropology and Archaeology, University of Bristol) - Machaoue López, Sonia (Departamento de Prehistoria, Arqueología e Historia 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

CAVES AGAINST THE FASCISM

Abstract author(s): Avin, Xuxes (Instituto de la Historia Contemporánea, Facultad de Ciencias Sociales e Humanidades, Universidad Nova Lisboa) - Coelho, Rui (Faculdade de Letras, Universidade de Lisboa)
Abstract format: Oral
Caves are 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 Caracol Archeology has led us to document the most varied material realities: 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 these 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 Zeraf 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 Jablanica, where since 1993 we have developed the Drežna project. Today, the inside of the cave is used as a cultural center. The human remains 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.

HAUNTED, SUBLIME, UNCANNY AND ABJECT: HUMAN CAVE ENCOUNTERS AND THE ROOTS OF HUMAN SUBJECTIVITY

Abstract author(s): Mikul Vrhovnik, Dimitrij (University of Ljubljana; Institute for the Protection of the Cultural Heritage of Slovenia)
Abstract format: Oral
This 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 through pre-personal relations between material bodies, things and places combined 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 expressed 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 bound- ary- 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. Abjection refers to the raw vitality of material, to the powers of the earth, the meaningless chaotic nature, sublime or non-human powers, the meaninglessness otherwise 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 be-coming human. They constitute the raw vitality of cave sites, its shell and its skin. The paper suggests that these expressions can be described in different ways, using interrelated concepts of uncanny, sublime or abject. All revolve around the theme of bound- ary-blurring, destabilisation breakdown and destruction of boundaries and concepts, make the world intelligible and meaningful.

HAUNT VICARIOUSNESS

Abstract author(s): Dowd 2015: Leach 2016: Peterson 2019)
Abstract format: Oral
In the particular case of the British Neolithic, caves and their affordances 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.

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In this presentation, we detail how we are recording and analysing the environments of these caves focusing on the ways that people interacted with them in prehistory. In particular, we have begun to record their sensorially stimulating micro-climate features, such as temperature, humidity, luminance, airflows, kinaesthetic and sounds, as well as mapping their archaeology remains. Based on previous work by Tringham, we are employing a “Paperless Mapping Methodology” for the cave survey and sensorial data georeferencing. Ultimately, we will correlate, in a computational environment, the archaeological data with the sensorial data, in order to define and compare the sensorial impact of embodied visits, occupations and performances in these spaces in different cultural, temporal and landscape contexts.

5 EMBODIED ART AND THE SENSORY EXPERIENCE OF PALAELITHIC CAVES

Abstract author(s): Oostervik, Barbara (Durham University)

Abstract format: Oral

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 the sensory experience likely influenced their choice for selecting locations. By leaving behind markings of their own bodies they gave their surroundings meaning. 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, I will present new results from 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 hidden 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 is 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 cave-human interactions. Most importantly, it illustrates that early humans, like us, explored caves with a sense of curiosity and imagination.

4 WHAT ABOUT ROCK-HEWN CAVES? THEORETICAL AND METHODOLOGICAL APPROACHES TO THE ART OF CARVING

Abstract author(s): Silvestri, Claudia (University of Pisa) - Lamasa, Anna (DIM-MaP/CNRS) - Porqueddu, Maria-Elsa (Universidad Autónoma de Madrid)

Abstract format: Oral

Since prehistory humans have been settling in underground shelters, often readapting the rocky walls through carving. Bedrocks and natural caves have been modeled by humans in order to forge organized hypogeous spaces, used for living or for ritual purposes. 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.

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. 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.

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.

7 UNDER THE SKIN OF COMMINGLED BONE ASSEMBLAGES: ELEMENT INDEX ANALYSIS AT THE COVESEA CAVES, NE SCOTLAND

Abstract author(s): Bristor, Lindsey - Shaw, Daniel - Arnott, Ian (University of York)

Abstract format: Oral

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 Neolithic (c. 3800BC) 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 ornament. Red deer 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 preliminary 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.
Oral

Kalogiropoulou, Evanthia - Kloukinas, Dimitris - Kotsakis, Konstantinos (Aristotle University of Thessaloniki)
La Rosa, Lorenza (University of Oslo)

Macrofabric, macrotrace, to better understand the manufacturing techniques employed in the production of pottery in these regions. The combination of technologies found. This research explores both the technological and stylistic attributes of pottery recovered from precolonial sites in the Caribbean.

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 Kiss. 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 craftpeople 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. In the initial period, 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 the case with the 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.

CHAÎNE OPÉRATOIRE, COMMUNITIES OF PRACTICE, AND POTTERY IN THE PRECOLONIAL NORTHERN CARIBBEAN; A GOOD MATCH?

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 tamping materials, as well as a wide range of inductive, transformative and additive processes that stem from and reflect continuous changeable and social developments, experimentation and transformation practices. These processes are not always arranged in a strict sequential order.

Additional to technological information, architecture offers a window to past behaviours, routine practices and lifeways. Chain operators of architecture and domestic structures, however, has not contributed much into the social context of their technological. 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 taskscapes, 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 taskspace fits well with the analysis of different sequences of activities within diverse spatio-temporal surroundings.

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 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 aesthetic and iconographical evidences. Spolia have been generally examined as enduring traces of antiquitas inserted in later contexts, as elements embedded in late antique or medieval constructions. The study of spolia became particularly popular during the 80ies.

Rock-cut tombs and hypogae are well known for the western Mediterranean Neolithic. Different aspects are currently discussed 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 underpin the application 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.

5

The chaine opératoire as a tool in interpreting the Rock-cut Tombs in the Mediterranean Neolithic

Abstract authors(s): Periquetti, Maria-Elsa (Economía y sociedad en la Prehistoria de Madrid. Universidad Autonoma de Madrid; Aix Marseille Univ, CNRS, Mirist Culture, LAMPEA, Aix-en-Provence)
Abstract format: Oral

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6

TACKLING BUILDING FEATURES AND SOCIALISING THE CHAÎNE OPÉRATOIRE: THE CASE OF NEOLITHIC KLEITOS 2 IN NORTHWESTERN GREECE

Abstract authors(s): Kalogiropoulou, Evangelia - Kousinas, 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 tamping materials, as well as a wide range of inductive, transformative and additive processes that stem from and reflect continuous changeable and social developments, experimentation and transformation practices. These processes are not always arranged in a strict sequential order.

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The Transfiguration of Antiquitas: A Technological Approach to the Study of Spolia

Abstract authors(s): Silvio, Claudia (University of Pisa MAPPa Lab)
Abstract format: Oral

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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, geoarchaeological 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 osteologies 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.

**How to Hew a Rock-Hewn Column? Applying the Concept of ‘Chaîne Opératoire’ to Study the Churches Workshops in Cappadocia (Turkey)**

**Abstract author(s):** Lamessa, Arais (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 workshops, I will consider the hewing process of a column.

Between 2007 and 2013, I had the opportunity to study rock-hewn techniques and workshop organisation for thirty churches dated between the 7th and 12th centuries. During this research, I observed two different technical processes for hewing a column on the site of Şirin kilise (Cappadocia, Turkey).

The first process can be observed in a church, most probably dated to the end of the 10th century, Toyak 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 contextualize 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 workshops, ethnoarchaeology and geology are the most relevant.

**Archaeology of Soundscapes and Soundscapes for Archaeology**

**Themes:**
- Theories and methods in archaeology: interactions between disciplines
- 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 (Universidad de Huddersfield) - Jiménez-Pasadoles, Raquel (Universidad de Valdés) (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 sound world 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 archaeoaesthetics 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 archaeoaesthetics, archaeological finds, iconographies, written sources and ethnoarchaeological research. We also encourage discussions about ancient musical instruments and their relation to both natural sounds and soundscapes, 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 Archaeoaesthetics of the EBA Mesopotamian Funerary Practices**

**Abstract author(s):** Calabrese, Agata Maria Catana (The University of Sydney)

**Abstract format:** Oral

The funerary area in Early Bronze Age Mesopotamia 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 explore EBA (c.2900-2300 BC) in exploring the experiential aspects of the mortuary and associated spaces. Exploring the experiential aspects of the mortuary sphere 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’ (SPADEGIS) 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):** Kipp-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 focuses on the relation of sounds and acoustic 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 were held without a roof different acoustic qualities, as an impulsive sound measurement in a padiakos circle revealed. In addition to the inside of buildings and 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 Abidos 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 divinities, 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, tonos, metrical 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 particular 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.
DINING IN A CIRCUS: AN ACOUSTIC READING OF PETRORUS’ COENA TRIMALCHIUSON

Abstract author(s): Mangari, Pasquale Mirco (Independent researcher)

Abstract format: Oral

In the description of a grotesque coena offered by Trimalchio to his friends and guests, Petronius stigmatizes 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 soundscape in fact. Petronius carefully depicts every sagging sound 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 realistic 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 ludic crisisenses.

THE KEMENCE KARADENIZ, A SPATIOTEMPORAL MEDIUM FOR UNDERSTANDING THE MEDIEVAL “VIELE À ARCHE”

Abstract author(s): Frouin, Clément (CEMM, EA 4583, Université Paul Valéry, Montpellier)

Abstract format: Oral

The fact that virtually no archeological trace concerning the vile à archet can be found has led today’s “archelothers” (string instru- ments makers involved in the reconstitution and reassessment of former musical traditions) to reinvent or rediscover a lost craft. We are convinced that the instrument is essential to music, implies it, and believe that a better understanding of the vile is vital to read deeper into the troubadou-r’s repertoire. To such an extent, in order to overcome archeological shortcomings and the lack of technical resources in contemporary iconography (mainly sulpture and illumination), we have set out to research instruments which belong to the same family, and have similar organisational characteristics and functions (voicing mechanisms). An instrument seems to complete those requirements: the kemençe-karadeniz, a small vile 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 troubadours’ repertoire. Therefore, we do share our conclusions regarding a first research fieldtrip to Turkey, which involves showcasing a kemençe’s production and drawing organisational parallels between this instrument and our medieval vile. Moreover, we will investigate types of play and performance, especially in 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 organisational parallels between this instrument and our medieval vile.

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 at their sounds a-tast- ed both under laboratory 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 well as significantly develop the field of archaeologicalacoustics. 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 architectural sites.

CREATION OF CAVE SOURCESCOPES SUITABLE FOR ANCIENT GREEK PANIC RITUALS FROM BINAURAL ROOM IMPULSE RESPONSE MEASUREMENTS

Abstract author(s): Youtisos, Niketarios-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-headed 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- rocal 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 Nympolept Archedimos in Vari, Lychnospilia cave on Mt. Parnitha) and in another with no evidence of abodes of spirits. Today hikers and practitioners of neoshamanism and neopaganism visit the same sites to renew their energies or connect 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 performed with the Odeon software. We use acoustic simulation to examine the role that historic changes in the water levels may have had on sound mapping, and to combine the available source-receiver positions in the cave with audio samples and to listen to the results.

RITUAL MUSIC AND THE CONFIGURATION OF LIMINAL SPACES: EXAMPLES FROM ARCHAEOLOGY AND ETHNOGRAPHY

Abstract author(s): Jiménez Pasoldas, Raquel (Universidad de Valladolid) / Universitat de Barcelona) - Díaz-Andreu, Margarita (IHEC & 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 to combine the available source-receiver positions in the cave with audio samples and to listen to the results. CAN YOU HEAR THE ROAR OF THE LION? UNPACKING THE SOURCESCOPES OF (INDIGENOUS) CULT AT MUSSAWWART ES-SUFRA, SUEDAN

Abstract author(s): Kitzian, Cornelia (Humboldt-Universität zu Berlin, Institut für Archäologie, ANGDA)

Abstract format: Oral

This paper provides an initial overview of investigations into the multi-sensory experience of (indigenous) cult, and especially its sourcescape(s), in ancient and recent Sudan. Mussawwarat es-Sufra, one of the major sacred 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 largest known temple for the indigenous lion-headed god Apedemak. In addition to the buildings themselves, temple fur- niture and consecration installations have been preserved together with (fragments of) the lion’s roar. Among the latter is a large iron trumpet, which may have been used in cult proceedings. This is supported by temple reliefs at Mussawwarat 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 theatrical gesta, 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 Mussawwarat is also planned to include the investigation of the sound properties and af- forances of various architectural structures and of the valley of Mussawwarat itself. The presentation also includes a brief overview of approaches to the public presentation of the ancient soundscape(s) of Mussawwarat.

SONIC RITUALS AND SOURCESCOPES OF SACRED SITES IN FINLAND: HISTORICAL TRADITION, CONTEMPORARY PRACTICE AND ACOUSTIC MODELLING

Abstract author(s): Rainio, Ritta (University of Helsinki) - Hyytynen-Ng, Elina (University of Eastern Finland) - Wolff, 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 19-20th 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 connect 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 performed 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 (detection), listener envelopment (FLiR) and IPL are discussed. Related myths, beliefs and ritual practices are traced from folklore archives and given ethnomusicological anal- ysis. Moreover, auditory experiences and subjective impressions of contemporary shamans 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, soundscape, religion and nature across the times.
11 THE ACOUSTIC ECOLOGY OF THE THE HÅL SAFLIENI HYPOGUEM IN MALTA

Abstract author(s): Tili, Rupert - Wolfe, Kristina (University of Huddersfield) - Swanson, Douglas (Unaffiliated)

Abstract format: Oral

The Hål Saflieni Hypogoeum is a unique subterranean Maltese Neolithic sanctuary with a well-documented history of interest in its acoustics. Following a pilot study, Tili 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 acoustical ecology of the Hypogoeum, 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 archaeoaoustics and sound archaeology. This results in a detailed systematic analysis and understanding of the Hypogoeum, 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 Muyrck, Julien - Faren, Antoni - Garriga, Adan (Fundació Eurecat)

Abstract format: Oral

The project BMI2 «Binaural Tools for the Creative Industries - which took place in 2017-2018» and was led by La Fundación 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 360° panning. The tools developed for BMI2 were used in particular for creating the binaural content of next-generation audio guides of three emblematic cultural sites: La Fundació ‘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 (garden 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 a 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, Anne-Kaisa - van den Berg, Mathilde - Nirimäki, Sirpa (University of Oulu) - Arosenius, 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 peripheral steps of Ice Age Europe, in the tundra and taiga of Prehistoric North- ern Eurasia and North America, and have remained an important game species in subarctic regions of the Northern hemisphere up until the present day. Modern peoples hunt reindeer and have herded as a means of food production, transport and ideological expression in many European 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 move in 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 (food caching, smoke against insects) are used to attach the reindeer to the human settlements. Recent advances in biomolecular archaeology, palaeo-archaeology, zooarchaeology, and the anthropology of reindeer using communities have opened new possibilities for researchers. This session focuses on new species 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 harding, reindeer in worldview and cosmology, the dichotomy of hunting vs. herding reindeer, and the effects of environment and climate on human-reindeer systems.

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-UMR5508 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 model of their movements. Modern palaeoecological 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, as the response of modern herbivores 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 herding and migration and on what type of habitat they lived. 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 hunting strategies.

2 PATHOLOGICAL PECULIARITIES BETWEEN MODERN ECOTYPES OF FENNOSSCOANDIAN REINDEER: INJURY PATTERNS AND IMPLICATIONS FOR DOMESTICATION AND PALEOECOLOGY STUDIES

Abstract author(s): Hull, Emily (University of Alberta) - Puolakk, Hanna-Leena (University of Oulu) - Semienick, Mitchell (University of Alberta)

Abstract format: Oral

The variety of relationships between humans and Rangifer tarandus in Fenno-Skandia are of interest to both zoocaeshologists and scholars of human-animal studies. Two subspecies of Rangifer tarandus are native to Fenno-Skandia. 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 differences affect the skeleton enough to create consistent patterns of pathological lesions. Additionally, both divisions in pathology 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) - Puolakk, Hanna-Leena - van den Berg, Mathilde - Salmi, Anne-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 (corraling), or intensified activity (draught). These 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 is wild forest reindeer and semi-domesticated reindeer, including free-ranging, working (hunting or draught) and zoo-reindeer of Northern and North-East Finland. Total of six different bone samples were scanned with pQCT (Stratec XCT Research SA1+) 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, radius, femur and tibia, reflecting greater strengthening 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 and zoo reindeer had more mediolaterally oriented humeral and radioulnar midshafts compared to free-ranging reindeer, which likely results from differences in feeding behavior. Metaphalangeal shapes of zoo reindeer were more mediolaterally oriented as compared to free-ranging reindeer, which may result from the sedentary lifestyle of zoo reindeer. Tibial midshafts were more mediolaterally oriented in working reindeer compared to free-ranging domestication status via observation of activity-induced patterns in bone elements from archaeological material.

The premise of this method is that castration delays epiphyseal fusion and thus allows the elongation of the bones, and long bones 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. Although the importance of castrates and their part in incipient reindeer domestication is widely recognized, no methods exist that can document the domestication status of reindeer bones. 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.

Unravelling Symbiotic Relationships: A New Perspective on Human-Reindeer Systems in Western Siberia

Abstract authors: Wendy, Morgan - Piezonka, Honny - Makeev, 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 practised 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 nuances in understanding reindeer management and distinctions between wild and domesticated reindeer populations. Applying these concepts to zooarchaeological and biomolecular approaches through proof of concept at Sámi archaeological investigations could better define human-reindeer systems used in the past. This paper, hunter-fisher-helpers of Siberia and their animals will be reviewed and this new framework for investigating reindeer husbandry systems will be presented.

Sami Animal Offerings and Reindeer Domestication in the Light of Ancient DNA Studies

Abstract authors: Sámi, Anna-Kaisa - Heino, Matti - Åkäsi, Taina (University of Oulu) - Mannermaa, Kristiina - Tukin, Tuula (University of Helsinki) - Sálink, Mikael (Russian Academy of Sciences) - Núñez, Milton - Olkonen, Jari (University of Oulu) - Dalén, Love (Swedish Museum of Natural History) - Aas, Leoni (University of Oulu)

Abstract format: Oral

Reindeer herding emerged among the indigenous Sámi of Northern Fennoscandia in the period between ca. 1600 and 1650 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 reindeer husbandry 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 of smaller scale than in the mountain areas and wild reindeer hunting continued. We analyze ancient DNA from three 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.

From Wild Reindeer Hunting to Reindeer Herding - New Practice and Ideological Changes.

Abstract authors: Andersen, Oddmund (Arann luolamsisk sentar)

Abstract format: Oral

From wild reindeer hunting to reindeer herding - new practices and ideological changes. The researchers in 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. This paper will present case studies from different parts of the landscape. Through a presentation of archaeological material, the goal is to discuss whether such ideological changes can be read in the landscape and landscape economy in the Lule Sámi area.


Abstract authors: Aronsson, Kjell-Ake (Åtta, Swedish Mountain and Sámi 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 Naration of Otar from about AD 892. A more detailed description of Sámi 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 Sámi 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.

Towards an Archaeology of Fermented Products: Building a Multidisciplinary Approach

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

Organisers: Driou, Léa (University of York, Department of Archaeology, BioCh) - Debels, Pauline (University Paul-Valéry Montpellier III, UMR 5140 Archéologie des Sociétés méditerranéennes; Université Paris 1 Panthéon-Sorbonne, UMR 8215 Trajectoires. De la sédentarisation à l’étalement)

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 early humans. 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

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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 (caramelo-
icogy, archaeobotany, use-wear analysis, organic residue analysis, 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 a new methodological perspective in order to show what qualities of wines are hidden behind certain phrases that were used by ancient authors to describe them. For example, certain ancient writers mentioned beverages, which were κιῤῥόι, that is yellow. However, what does it really mean in terms of the production of such wines? At the same time, the ποτήρια, καταφέρα, 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. Iacumin 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 revising the taste of wine that the Romans enjoyed. Therefore, this presentation will use both modern, onomological 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):** Driou, Léa (Department of Archaeology, BioArCh, University of York) - Drocqighl, Paola (Department of history, patrimonio culturale, formazione e società, Università degli Studi di Roma Tor Vergata) - Capelli, Claudia (Department of Science della Terra, dell'ambiente e della vita, Università degli Studi di Genova) - Mico, Antonio (Department of storia, patrimonio culturale, formazione e società, Università degli Studi di Roma Tor Vergata) - Luny, Jasmine (Department of archaeology, BioArCh, University of York) - Molinari, Alessandra (Department of 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 optimizes 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 the presence 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 the presence of other small acids makes their presence in archaeological ceramics misleading.

### 135 ARCHAEOGENETICS, THE REAL MEANING: TOWARDS SYNERGIES BETWEEN GENETICS AND ARCHAEOLOGY

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

**Organisers:** Szczepan-Nagy, Anna (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Mittrick, Alissa (Department of Genetics, Harvard Medical School, Boston; Department of Archaeogenetics, Max-Planck Institute for Science of Human History, Jena) - Ruviala, Maita (Department of Archaeogenetics, Max-Planck Institute for Science of Human History, Jena) - Pagani, Annalisa (UMR 5129, 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 last decade, archaeogenetics and geneticists have been equally confronted with revealing the most unexpected findings from the respective other fields. 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 those different levels of human history overlap, where do they not? How can genetic 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 (e.g., 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.
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 extent of the research questions we ask, the language we use to explicate our results. We believe that this sort of intellectual cross-pollination nourishes 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.

THE ANCIENT GENOME ATLAS - A NEW OPEN-ACCESS INTERACTIVE ONLINE TOOL

Abstract author(s): Nortoft, Mikkel - Schroeder, Hannes (The Gisela 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 interactive controls, users can explore how migrations and gene flow have changed the genetics of human populations over the last ~60,000 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).

CULTURAL AND GENETIC DIVERSITY SHAPED BY THE NEOLITHIC TRANSITION

Abstract author(s): Santos, Patricia (Centre National de la Recherche Scientifique - CNRS, UMR5199 PACEA) - Ghisletta, 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 onmat dataset with ancient genetic data for human populations living in Europe during the Neolithic/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 synchronous, and to try to infer the degree of cultural and social permeability between biologically distinct populations.

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) – Kölbl, Mario – Novická, 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 geneticists, archaeological and anthropological information, isotope analysis and new modelling approaches to answer questions about mobility and migration, social structure, kinship and pedigrees of prehistoric societies in Central Germany. By analyzing new genome-wide data in this way for an additional 338 individuals from central Germany, ranging from the early Neolithic to the late Bronze Age (~2950 to 2960 calBP), we aim to address these questions. The genetic results are consistent with previous findings about German early and medieval 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 patrilocally society with a low variability in male Y-haplogroups in contrast with much more varied mt-haplogroups.

ARCHAEOLOGY AND GENETICS EULIDICATE SOCIAL STRATIFICATION, KINSHIP, AND DIVERSE DEMOGRAPHIC PROCESSES IN NEOLITHIC AND BRONZE AGE CROATIA

Abstract author(s): Frasilj, Suzanna (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 further with genetic means, two sites in northeastern Croatia dated to the late Neolithic and the Middle Bronze Age Transdanubian Encroated 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-strand 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 ancestry, 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 clusters of individuals who exhibit archaemongous 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.

INFERENCES ON ORIGIN AND SOCIAL ORGANISATION OF EARLY AND MIDDLE BRONZE AGE COMMUNITIES LIVED IN THE WESTERN CARPATHIAN BASIN

Abstract author(s): Darber, Dániel - Szőke, Onsulya (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Starfer, Bea (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Ghirotto, Silvia (Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Köhler, Kitti - Mende, Balázs (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Fábián, Szilvia (Hungarian National Museum, Budapest) - Kiss, Viktória - Szőke-Szöke, Onsulya (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 a critical turning 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 650 years between 2120–1550 BCE. Their genetic makeup, however, is yet to be described, which has been obstructed due to the dominant cremation practices from 1880-1500 BCE onward. By analysing whole genome target cap-
ture and shotgun data of 19 newly sequenced individuals from Balatonkeresztúr-Réti-nél 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 also intended to extend our dataset for more detailed analyses of the region and period. This project was fund by
the Mobility Momentum Research Group S.P.2015.09 of the Hungarian Academy of Sciences.

7 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
- Archaeogenetics, Max Planck Institute for the Science of Human History; School of Biological Sciences, Seoul National
University) - Fregeiro, María (Department of Prehistory, Universitat Autònoma de Barcelona; Department of Archaeogenetics, Max
Planck Institute for the Science of Human History) - Rihuete-Herrada, Cristina - Micó, Rafael - Oliart, Camila (Department of
Prehistory, Universitat Autònoma de Barcelona; Department of Archaeogenetics, Max Planck Institute for the Science of Human
History) - 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 interaction of demograph-
ic, 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 Palaeolithic 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 analy-
sis to get a better understanding of the LBA of the region at the LBA of Central Europe. Ancient DNA analysis sheds 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 indi-
viduals 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 multigeneration burial rite.
Over the last decades, indicators from 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 complete picture of the past.

8 LA ALMOLOYA AND THE SOCIAL STRUCTURE OF ARCAIC SOCIETIES IN THE EARLY BRONZE AGE OF SOUTHERN IBERIA
Abstract author(s): Villalba-Mouro, Vanessa (Department of Archaeogenetics, Max Planck Institute for the Science of Human
History) - Rhueute-Herrada, Cristina - McCoy, Rafael - Dillert, Camila - Figueira, Maria (Department of Prehistory, Universitat Autonó-
ma de Barcelona) - Roblach, A - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human
History) - Villalba-Mouro, Vanessa (Department of Prehistory, University of Seville) - Lui, Victoria (Institute of Archaeology, Eötvös
Loránd University, Budapest) - Haak, Wolfgang (Max Planck Institute for the Science of Human History, Department of Archaeo-
genetics, Max Planck Institute for the Science of Human History).
Abstract format: Oral
The amalgamation ofBronze Age in Southern Iberia involved important changes from an archaeological perspective: Late Chalcolithic set-
tlements were abandoned in favour of – occasionally fortified – hilltop sites. At the same time, funerary rites also changed with collective
graves disappearing and individual and double burials emerging. Some of the later exhibit very distinctive grave goods which indi-
rectly reflect an increasingly hierarchical social organisation. These changes are particularly marked in the Early Bronze Age group of
El Aragón, 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 archaeo-
logical indicators alone, we performed population genetic and kinship analyses at La Almoloya, one of the key sites of the EBA group which
is nearly fully excavated. We integrated the genetic results with chronology-stratigraphy, information about burial rites and the
archaeological 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 patri-linear 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.

9 GENOMIC ANALYSIS OF HUMAN REMAINS RECOVERED AT THE PHOENICIAN-PUNIC HYPOGEA FROM VILLARROCS (ALMERIA, SPAIN)
Abstract author(s): Odlaug, Kyle (Institute of Evolutionary Biology, CIBIC-Universitat Pompeu Fabra, Barcelona) - Ringbäauer,
Harald (Department of Genetics, Harvard Medical School, Boston) - Mittnik, Álka (Department of Genetics, Harvard Medical
School, Boston) - Rodero, Alicia (Museo Arqueológico Nacional, Madrid) - Rodríguez, Nadin (Department of Genetics, Harvard Med-
ical School, Boston) - Lalausas-Fox, Carlos (Institute of Evolutionary Biology, CIBIC-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),
found circa 8th century BC and remaining under Phoenician/Punic control until the Roman Conquest during the Second Punic war.
Excavations at its associated funerary area, the Villarrocs hypogaeum, started in 1890 by Luis Brest uncovering 1,842 graves whose
associated materials were deposited at the Museo Arqueológico Nacional (Madrid, Spain) in 1935. The most prominent set of graves in
the hypogaeum excavated directly on the rock that were likely associated to the ruling elites of Baria. To understand the ances-
torial origins, degree of integration with the locals, and social structure of the people buried in the hypogaeum, we obtained permission
to apply archaeogenetics techniques to the human remains from the excavation and generated genomic data from 77 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 females, another with a Central/eastern Mediterranean
origin and another with varying degrees of North African ancestry. We highlight the results from hypogaeum 774 where the five ana-
lized individuals had a Central/eastern Mediterranean origin, were close relatives and showed clear genetic evidence of being off-
spring of related parents. These results provide an unprecedented view into the social organization of the elites of a Phoenician/Punic
community and should be integrated together with the abundant archaeological information available for the Villarrocs cemetery.

10 UNDERSTANDING AND RE-INTERPRETING THE URVILLE-NACQUEVILLE BURIED COMMUNITY: A DIALOGUE BETWEEN ARCHAEOLOGY AND GENETICS
Abstract author(s): Fischer, Claire-Elise (Pompeo, Marie-Hélène (UMR E199 PACEA) - Lefort, Anthony (INRAP) - Rottier,
Stéphane - Deguilloux, Marie-France (UMR E199 PACEA)
Abstract format: Oral
Over the past decades, ancient DNA (aDNA) studies have mainly addressed broad continental scale issues in order to provide new lines of evidence concerning ancient human population’s dynamics. Only very recently, archaeological-genetic studies targeting whole commu-
nities 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-Nacqueville (Late Iron Age, Nor-
mandy, France). a necropolis that welcomed a cosmopolitan group associated to a port facing the Channel. Through several exam-
iples, we will show how genetic data have permitted to reinterprate several funerary gestures, notably the recovery of skulls or
the constitution of the “dead community”, addressed through archaeological, anthropological and small-scale ADN approaches.
constitute a preliminary process necessary to the appropriate use of the gene pool needs for the reconstruction of broad-scale
population dynamics.

11 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, Department of Genetics, ELTE Eötvös Loránd University) - Kocz, István (Institute of Archaeological Sciences, ELTE Eötvös Loránd University) - Méndez, Bálint - Csáky, György (Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences Centre of Excellence) - Jeong, Choon-Won (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, School of Biological Sciences, Seoul National Universi-
ty) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History) - Vida, Tivadar (Hungarian Academy of Sciences Centre of Excellence, Institute of Archaeological Sciences, ELTE Eötvös Loránd University) - Szlávocsányi-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 Dagastana) which played an important geopolitical
color in Central European history. The Asian origin of Avars is supported by written sources as well as archaeological find-
if, 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 primary 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 heterogeneous compared to the paternal gene pool, which is mostly composed of H1a1 M45 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 “Kun-bibory” 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 Tataria 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 groups 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.

A NEW STUDY ON A WEAPON GRAVE AT SUONTAKA, FINLAND

Abstract authors(a): Molinien, Ulf (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, Tuja (University of Helsinki, Department of Philosophy, History, Culture and Art Studies) - Sari, 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; 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) - Salmela, Elina (University of Helsinki, Faculty of Biological and Environmental Sciences, Organismal and Evolutionary Biology Research Programme) - Rohvach, 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) Tyrväntä 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.

A HAPPY MARRIAGE: THREE EXAMPLES OF INTERDISCIPLINARY RESEARCH IN THE CANARY ISLANDS

Abstract authors(a): Ordóñez, Alejandra (Department of Geography and History, Humanities Faculty, Section of Prehistory, Archaeology, and Ancient History, University of La Laguna) - Fregel, Rosa (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) - Arroyo, 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 paleogenetics revolution, nobody dares 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 interdisciplinarity 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 oral traditions 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 GENOME-WIDE STUDY OF THE 12TH CENTURY COMMUNITIES ILLUMINATES GENETIC MAKEUP IN THE LATE IRON AGE SOUTHWEST FINLAND

Abstract authors(a): Sari, 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) - 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 Kansakoulumäki 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 archeogenetic study we investigate the genetic composition of altogether 29 individuals, 14 from Kansakoulumäki 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 Kansakoulumäki 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.

MATERIALIZING SOUND IN ANTIQUITY: MATERIALS AS A BODILY AND SYMBOLIC COMPONENT OF SOUND OBJECTS

Theme: 6. Theories and methods in archaeology; interactions between disciplines

Organisers: Staura-Ziegelmeyer, Arnaud (Université Toulouse Il 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 archaeomusical studies. They allow us to assess the acoustic capacities of artefacts and to reconstruct the soundscapes of Antiquity. Bronzes (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 intrinsic 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? 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 Mesoamerican 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 archaeomusical 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 methodology (approaches, typology, archaeology, etc.). Historiographical questions raised by the themes. 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.
ABSTRACTS

1 TERRACOTTA FIGURINES AS INSTRUMENTS IN HELLENISTIC BABYLONIA: THE MATERIAL INTERSECTION OF REAL (TERRACOTTA) RATTLE AND DEPICTED (METALLIC OR LEATHER) PERCUSSIVE
Abstract author(s): Lengnij-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 children's busts, the figure is shown holding and/or playing a circular object - either a small, wooden 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 partake in the “performance” - perhaps in a less skilled manner with an instrument with fewer tonal subtleties, but with similar quality of sound.

2 CLAPPERS IN ANCIENT EGYPT -WOOD OR IVORY FOR THE SAME EVENT OR RITUAL?
Abstract author(s): Kipp-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 unadorned and bent, others are richly ornamented with the face of the goddess Hathor. Furthermore there are besides 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 material appear in and what context are they attested? Does it change in the course of time? Are the different materials a question of status and prestige, of musical importance? Do the various materials have different connotations? Is it possible to assign a state of attention of a god, and others “only” to give rhythm to dances, 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 researchers)
Abstract format: Oral
Italic populations of Bronze and early Iron Age are still mysterious for archaeomusicologists. The lack of written sources, and the he-
gemony of funerary contexts among the archaeological sources as well, drastically reduces the research frame related to sounding materials. In this respect, the comparison with the analogous luxation of ornaments in the Attic and Etruscan corpora enlightens the function of these additives for sound objects. Following this perspective, already announced elsewhere (COLOGNEO 2018), our analysis will focus on three additive categories: ivory, leather, and wood. We reveal some of these different kinds of lyre materiality, related respectively to 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. DELI 1989). In addition, translation problems will be addressed with particular concern for “golden compounds”. How should we translate the khrusos-adjectives referring to the lyre surface? Why, how and for whom does the artisan make a lyre shine? What is gold chosen instead of instead of ivory or wood? Does the lyre materiality express 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 features of the lyre (size and shape).

4 THE IMPORTANCE OF THE MATERIALS USED IN THE ICONOGRAPHIC REPRESENTATION OF MUSICAL INSTRUMENTS IN IBERIAN CULTURE
Abstract author(s): Izquierdo-Torrentera, Lida (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 musicological evidence. Additionally, the archaeology of music is still in its infancy. 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-a-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 Torijos de la Sierra in the Guadarrama Mountains, and another one from Vígata de la Morena with the same name from Olivaré. 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 impor-
tance of these instruments in different aspects of life in the Iberian world, such as celebrations of dances and or processions, banquets, religious rituals, conflicts, and moments of daily life such as childhood and death.

GOLD, IVORY AND WOOD. LYRE’S MATERIALITY IN ATTIC INSRIPTIONS
Abstract author(s): Colangelo, Eleonora (Università di Parma - Centro ANIMA, Parma - University of Pisa; Istituto Italiano di Presia- toria delle Ricerche Museo Archeologico Nazionale, Firenze)
Abstract format: Oral
Several inscriptions from Attica show a lexical tachism in describing the decorum of musical instruments (see e. g. Α. 13.434. 13.44, within these inscriptions, it is of interest not only the sequence of the objects (musical instruments - lyres – plus other vextive or cosmetic devices), but also the progression of their adjectives (i.e. κατάχρυσος, ἐλεφάντινος, ξύλινος). 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 luxation of ornaments in the Attic and Etruscan corpora enlightens the function of these additives for sound objects. Following this perspective, already announced elsewhere (COLOGNEO 2018), our analysis will focus on three additive categories: ivory, leather, and wood. We reveal three different kinds of lyre materiality, related respectively to 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. DELI 1989). In addition, translation problems will be addressed with particular concern for “golden compounds”. How should we translate the khrusos-adjectives referring to the lyre surface? Why, how and for whom does the artisan make a lyre shine? What is gold chosen instead of instead of ivory or wood? Does the lyre materiality express 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 features of the lyre (size and shape).

DIGITAL SENSORIALITY AND 3D VIRTUAL RECONSTRUCTIONS OF ANCIENT MUSIC INSTRUMENTS
Abstract author(s): Ballia, Angela (National Research Council of Italy)
Abstract format: Oral
Virtual reconstruction of ancient musical instruments e.g., the exceptionally well-preserved instruments, aulos and lyres (V-VI BC) found at Poseidonia and Metaponto, as well as the aulos found in Salinum (under ‘Tomba R’, very close to the cultural 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 revealing sound emissions and, by virtue of these methods, some of the subjective observations typically made by or-ganists or other ancient instrument makers. Using traditional and modern methods, the cultural and technological aesthetic dei-
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 sensorial-
ity” of musical instruments and advance archaeomusicology’s assessment of ancient music.

THE LIQUID MATERIALITY OF THE ANCIENT GREEK AULOS
Abstract author(s): Simone, Caleb (Metropolitan Museum of Art; Columbia University) - Armstrong, Calum (Woodwind Special-
ized)
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 exam-
ine 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, aulic music is described as having a liquid materiality characterized by pouring and flowing. In a passage exploring the dynamics of vocal sound production, the Periatic poet of the De Aubulis (180bc) offers an evocative quote from aulos playing that links this liquid aesthetic materiality with the practice of aulos sound production. The author describes aulos reeds that “have been soaked” (babeomene) and “have drank in” (pepeka to sain) as creating the kind of homogenous, even, and smooth texture in the reed blades that produces a superior sound compared with dry reeds (sara).
SHAPING CULTURAL LANDSCAPES: CONNECTING AGRICULTURE, CRAFTS, CONSTRUCTION, TRANSPORT, AND RESILIENCE STRATEGIES. PART 1

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 undertaking, 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 results which have become known to us as “monolithic” understandings of societies, the elite-labour/farmer and the centre/rural dichotomy. The economic, social, and political 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 dichotomy because the many social groups co-dependent on each other, albeit perhaps in unequal measure, depended 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. Soane & Prof. Paul Erdkamp

ABSTRACTS

1. MARBLE IN THE MOUNTAINS - ECONOMETRICS OF QUARRYING AND TRANSPORTING BUILD 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 Delaina, 13 km SE of Tegea. The marble was quarried from the Archaic period onwards and used a g. in the 4th century BCE temple of Athena Alea at Tegea. The source of large-crystal white marble used for monumental architectural sculpture in Arcadia has been argued to originate in the Mars in the southern Levkas. Local stones were also employed, such as the conglomerate in the foundations of the temple of Athena Alea. An important factor in the quarrying of marble was the employment of water and the large number of waterwheels employed throughout Greco-Roman Antiquity. The site of Tegea is situated at the Triopion Plain at an altitude between 650 and 700 meters and the Tegean marble quarries near the mountain village Delolina at between 900 and 1200 meters. Previous discussions of the Doliana quarries have viewed them as passive natural resources that were exploited locally at Tegea and to some extent also exporting 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 resilience 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 contributed to the location and shaping of settlements, rural 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 quarry in the establishment of rural 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.

2. MATERIAL AGENCY AND RESILIENCE: NEW APPROACHES TO THE MARBLE QUARRIES OF ANCIENT TEGEA

Abstract author(s): Bakke, Jorgen (University of Bergen)

Abstract format: Oral

Builders from the Ancient Greek city-state of Tegea used marble from an ore in the northern Poron range in the Peloponnese already around 600 BC, and the ore was probably exploited throughout Greco-Roman Antiquity. The urban site of Tegea is situated at the Triopion Plain at an altitude between 650 and 700 meters and the Tegean marble quarries near the mountain village Delolina at between 900 and 1200 meters. Previous discussions of the Doliana quarries have viewed them as passive natural resources that were exploited locally at Tegea and to some extent also exporting 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 resilience 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 contributed to the location and shaping of settlements, rural 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 quarry in the establishment of rural 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 EPIDAURUS

Abstract author(s): Vanden Broeck-Parient, 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 basic materials recorded in inscriptions show which 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 with the contract prices provides us with valuable insights into agrarian and infrastructural contexts. The paper shows a positive 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 calculations shed 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 ARCHAEOOMETRIC 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 - CSIC, 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 monumental material assemblages, resilient to the hierarchical social and political organisation models we can observe in other areas within NW Iberia (Gonzalez Rubal 2012). However, an archaeometric study of Late Iron Age ceramics from the hillfort of El Castru in Vigaña (Asturias, Spain) has shown that ceramics used by the inhabitants of this site were probably transported across significant distances through the mountainous landscapes: evidence may imply that pre-Roman communities were more isolated than previously assumed, which is all the more surprising considering that zooarchaeological, carpological and archaeometric 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 ceramics and tools. Two established approaches are employed in this paper: the calculation of the transport cost for ceramic raw materials and the principle of least effort for the transport of raw materials. This will allow us to investigate the social strategies that were used by the inhabitants of El Castru in Vigaña for the production of ceramics and tools, and to map the routes that were used in this process. The results, which will be presented in the conclusion of the paper, will shed light on the strategies that were used by the inhabitants of the site for the production of ceramics and tools and the routes that were used in this process. 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 with the contract prices provides us with valuable insights into agrarian and infrastructural contexts. The paper shows a positive 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 calculations shed 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.

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A CROSS-CRAFT APPROACH OF CERAMIC, GLASS AND IRON IN THE EARLY MIDDLE AGES. THE RESOURCES OF WORKSHOPS FROM SOUTHERN BELGIUM

Abstract author(s): Von Wersch, Line (UeLige) - van Haperen, Martina (Leiden University) - Pagas, Gaspard (CMRS)

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 their 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 what artisans obtained and used, 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, the technical transformation took place that fundamentally altered the modus operandi of these crafts. The factors involved in these transformations are still part of the blocks of discussions and interactions and artisan networks could very well have been key triggers of innovation.

We propose to approach crafts and their interactions using their respective “chaine opératoire”, 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.

HUMAN-WATER INTERACTION AND ITS IMPACT ON SOCIETY AT LE QUARTIER DU THÉÂTRE, DELOS, DURING THE LATE-HELENIISTIC 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, especially and 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 comparatively 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, 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 before the demise of the Mycenaean societies.

Building the tholos tomb in Tyrins: Comparative labour costs and field methods

Abstract author(s): Bysbaert, Ann - Vikatou, Irene (Leiden University)

Abstract format: Oral

In the MBA Argolid, Greece, monumental architectural remains comprised of citadels, tholos tombs, fortress walls, and engineering works such as roads, bridges, and culverts. 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 pathways were in use as well, and possibly for much longer periods of time, so well before the end of the MBA period and also reconstruct any of those 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 19th-12th centuries BCE? How did the construction of these road impacts led to the establishment of enduring patterns of social complexity.

Indicate that the blocks themselves had special importance, and that they had symbolic or religious significance. The talks involved in these transformations are still part of the block of discussions and interactions and artisan networks could very well have been key triggers of innovation.

We propose to approach crafts and their interactions using their respective “chaine opératoire”, 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.

MONTMENUS, SOCIETY AND LANDSCAPE IN PREHISTORIC EUROPE

Abstract author(s): Scanes, 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. While the latter reveal how major projects of monument construction could be associated with the creation and consolidation of power structures, demonstrating the ability of elites 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’ origins and uses had special importance, and that they held and transmitted symbolic messages.

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 middle to late Neolithic and southern Britain in the middle to late Neolithic 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 change that characterised prehistoric and early historic societies.

COMBINED METHODOLOGIES AND ANALYSES OF THE ROAD NETWORK DURING THE LATE BRONZE AGE AROLOID, GREECE.

Abstract author(s): Bysbaert, Ann - Vikatou, Irene (Leiden University)

Abstract format: Oral

In the MBA Argolid, Greece, monumental architectural remains comprised of citadels, tholos tombs, fortress walls, and engineering works such as roads, bridges, and culverts. 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 pathways were in use as well, and possibly for much longer periods of time, so well before the end of the MBA period and also reconstruct any of those 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 19th-12th centuries BCE? How did the construction of these road impacts led to the establishment of enduring patterns of social complexity.

Indicate that the blocks themselves had special importance, and that they had symbolic or religious significance. The talks involved in these transformations are still part of the block of discussions and interactions and artisan networks could very well have been key triggers of innovation.

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BUILDING THE THOLON TOMB IN TYRINS: COMPARATIVE LABOUR COSTS AND FIELD METHODS

Abstract author(s): Bysbaert, 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 erect them, often monumental, burial. While the phenomenon started in Messenia, the largest ones were constructed in the Argolid. Mycenaean-Mycenaean 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 Tyrins. This large tholos, located east of Tyrins’ citadel, was excavated and published by the DAH 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 at least two main types of recognizable limestone were used for the construction of this tomb. In contrast to most other nearby tholoi of the same period and the clearing presence of conglomerate in the citadel. The door jams of the stonework were embellished with plaster, possibly painted, a feature also noted on various other tombs of this period. Labour calculations will cover all materials and apply a relative index comparing the cost with that of other standard tomb types in southern Greece.

SHAPING A MYCENAEN 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, was 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 we 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 suggests 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 mar-

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LANDSCAPE, POWER AND ECONOMY IN THE WESTERN MEDITERRANEAN LATE BRONZE AGE-EARLY IRON AGE (C. 1150-600 BCE)

Abstract author(s): Prusaczyk, Daniel (University of Warsaw) - Remise, François (EPHE)

Abstract format: Oral

Archaeological interpretation is often tautological. 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-urbanisation". 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 3000 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.


Abstract author(s): Ramisa, 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.

SHAPING CULTURAL LANDSCAPES: CONNECTING AGRICULTURE, CRAFTS, CONSTRUCTION, TRANSPORT, AND RESILIENCE STRATEGIES. PART 2

Theme: 1. Networks, networking, communication: archaeology of interactions
Organizers: 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 undertaking, 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 craftings perspectives. Rural landscapes and their population 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 were formed 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 depended on each other, albeit perhaps in unequal measure depending on the given context.

The aim of the paper is to present studies aimed at understanding the relationships between the "rural" landscape of Tetzczotzinco and the city of Tetzczotzinco. Our research shows, among others economic relationships between the two centers. Tetzczotzinco, where an elaborate 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 Tetzczotzinco, but also distributed it to distant cultivated fields. At the same time, the localization of Tetzczotzinco 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 and integration of outsiders, including Polynesian settlers around 1000CE and European Missionaries in the 1800s.

The paper presents the results of four years of intensive archaeological survey in the south Vanuatu region, focusing on the islands of Tanen, 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.

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 Teotihuacán and how it 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, Teotihuacán’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.

MAKING ISLANDSCAPES IN SOUTH VANUATU

Abstract author(s): Flecker, 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 ‘islandscapes’, 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 Tanen, 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.

TETZCOCO - "CENTER-PERIPHERY" RELATIONSHIP IN THE AZTEC EMPIRE

Abstract author(s): Psucazyck, Daniel (University of Warsaw)

Abstract format: Oral

Tetzczotzinco is one of the best-preserved “rural residences” of the Aztec rulers in Mexico and is one of the few remainings of the activity of the city of Tetzcooco, one of the most important centers of the Aztec Empire. Despite numerous studies, none of the researches attempted to understand the relationship between the central city and the peripheral Tetzczotzinco, which is still only considered as “the gardens of the rulers of Tetzcooco”. It is only our recent, broad-context research that aims to understand the importance of Tetzczotzinco as a Tetzcooco’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 Tetzczotzinco and the city of Tetzcooco. Our research shows, among others economic relationships between the two centers. Tetzczotzinco, where an elaborate 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 Tetzczotzinco, but also distributed it to distant cultivated fields. At the same time, the localization of Tetzczotzinco 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 and integration of outsiders, including Polynesian settlers around 1000CE and European Missionaries in the 1800s.

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The whole analysis can help in understanding the complex “center-parish” relationships in the Aztec world.

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TOWNS IN A SEA OF NOMADIES: TERRITORY AND TRADE IN MEDIEVAL SOMALILAND

Abstract authors(s): de Torres Rodriguez, Jorge (Incipit - Instituto de 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 geographiacal and ethnically regions, providing stability for trade and challenging the powerful Christian Kingdom of Abyssinia to the north. They also acted as one of 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 trade 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 through 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.

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AFTER THE COLLAPSE. AN INTERDISCIPLINARY CONTEXTUALIZATION OF THE RISE OF NAACHTUN (GUATEMALA).

Abstract authors(s): Huyse, Julien (UMR 8096 ArchAm) - Castarèt, Cyril (LPGM UMR 8591) - Dussod, Lydie - Purdau, Louise (CEPAM UMR 7264) - Ndongé, Philippe (UMR 8096 ArchAm) - Tomadini, Noémi (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 hillsides, at a great expense of stone and time. Just after the so-called “Preclassic Collapse”, circa CE 150, which saw the abandonment of a very elaborate system of mass ceremonial centers, the Maya Lowlands erupted 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, formed 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 dilemma 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.

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CLASICAL AND HELLENISTIC POTTERY KILNS FROM GREEK AREAS IN THEIR NATURAL AND HUMAN LANDSCAPES

Abstract authors(s): Tomé, 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 (e.g., chora of Metaponto) and in the main urban centre (e.g., the keraunikes of Metaponto asy), where resource gathering and the destination of use of pottery might have been different.

7
TWO MILLENNA OF AGRICULTURE AND LANDSCAPE CHANGES IN THE SABOR VALLEY IN PORTUGAL: A VIEW FROM THE ARCHAEOBOTANICAL RECORD

Abstract authors(s): Tereza, João (CIBIO - Research Center in Biodiversity and Genetic Resources, Univ. of Porto; Centre for Archaeobotany, SARAS, School of Arts and Humanities, University of Lisbon; MMHC - 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 (IN Portugal) revealed profound changes from 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 landscape, 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 (Dastelnho), which might 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, deepening its landscape and the economy of its inhabitants. Several 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 authors(s): Drukumper, Paul (KU Leuven 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 (Waldon and Rosen 2018). Undeniably true, but do medals 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, clamped 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 millennium — 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 untidily working for the common good. The role of socio-economic and cultural factors, a historian would argue, contracts universal truth.

9
HOW RESILIENT WERE ROMAN CADASTRES? THE CASE OF THE PONTINE CENURITION

Abstract authors(s): Haas, Tyron (Leiden University)

Abstract format: Oral

Traces of Roman cadastres (cenuritions) 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 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 ETURIA - NEW OBSERVATIONS ON THE SUBURBIVM OF ROME

Abstract authors(s): Pascua, Paul (Johannes Gutenberg-Universität Mainz)

Abstract format: Oral

The extension of the suburb of the city of Rome, which encompasses amongst other things a religious, juridical, economic, and
social dimension, is still the subject of intense controversy. Modern research usually assumes a radius of 50 km for the economic
suburbs of Roman cities. This assumption will undergo critical reassessment in my paper. Attention shall be paid to the relationship between
urban and rural transport infrastructures and their influence on the economic penetration of the hinterland of Rome, taking
agriculture, crafts, and natural resources via a set of proxies into account. Of particular interest is whether signs of space-time
compression can be observed, which is one of the essential features of the process of globalization. Or to put it another way, can
modern globalization theory provide a better understanding of economic integration in the Roman Empire, and does it help to better
analytically comprehend connectivity? Furthermore, the relationship between topography, natural resources and their manipulation
and exploitation are further aspects to be considered. The example of Southern Etruria in the Roman Empire, the multidimen-
sional arrangement of economic networks with different ranges is to be examined via a new, polythetic comparative method based
on the use of a set of proxies.

11 THE AGRICULTURAL HINTERLAND OF AQUINCUM AND BRIGETIO. LANDSCAPE, RURAL SETTLEMENTS, TOWNS AND THEIR INTERACTIONS

Abstract author(s): Simon, Benő (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 adminis-
trative 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 settle-
ment pattern in the hinterlands of Aquincum (Óbuda, Hungary) and Brigetio (Komárom-Szény, 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 geographic economy works of T. Bakker-Nilsson (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 sustenance of the city and the legionary camp on the Danubian ripa.

12 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 26 km in a straight line from the ancient center of Ratiara. 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 necropo-
lis is rural, with a clear predominance of the cremated individuals (28 graves) over the inhumed (14 graves) in a 2:1 ratio. Ocremations were not performed on the spot. Some other interesting fact is that only infant individuals were inhumated.

The burial facilities are varied: built with twigs, with stones and ordinary burial pits. The grave equipment is represented by cos-
tume 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 archeology in context of Roman Danubian Limes.

13 SUPPLY SYSTEMS ON THE DANUBE LIMES AND IN ITS HINTERLAND – THE CASES OF NICOPOLIS AND NOVAE IN MOESIA INFERIOR

Abstract author(s): Dias, Lina (Austrian Academy of Sciences)

Abstract format: Oral

The site of Nova in 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 46 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, Nova 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-nove foundation of Trajan that was installed around 60 km south of Nova along the riv-
er Yantra. These ceramic production sites (Pawlikowi, 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 Pawlikowi, Butovo, and Hotnica were clearly geared towards serving region-
al markets, as their commodities have frequently been found in Nova. This raises questions of the exact functioning of regional
supply systems and the interdependences 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 Nova and Nicopolis, this paper discusses ap-
proaches to narrowing down 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.

162 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 thou-
sand-year period.

ABSTRACTS

1 BEYOND A FASTENER: AN EXPLORATION OF IDENTITY THROUGH AN AMBER BEAD IN EARLY MEDIEVAL KENT

Abstract author(s): Girkiewicz Downer, Abigail (University of Chester)
Abstract format: Oral

Between 589 and 687, Sonia Chadwick Hawkes excavated the early medieval burial site of Finghall, Kent, uncovering a total of
216 inhumations (Chadwick Hawkes & Grainger 2006, p. 16). 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.

Archaeology."
2

AN ETERNAL TREASURE. AN EXPLORATION OF AMBER’S CONCEPTUAL VERSATILITY IN EARLY MEDIEVAL ALSACE, KENT, AND EAST ANGLIA

Abstract author(s): Gökçe Özdemir, Aslı Öğretmen (University of Chester)
Abstract format: Oral

When encountered in early medieval burial assemblages, amber artifacts 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 derives amber’s various contextual positions and uses in burial practices and emphasizes 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, Pietrajan - Croix, Sarah - Sindbæk, Søren (Centre for Urban Network Evolutions - UbNet, 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 artifacts 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, helmets and an arrow with a sword image usually identified as a valkyrie. These fragments were found in a workshop context datable to the first half of the 9th century. In this presentation, we challenge the current interpretative 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 contextual 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 artifact in religious belief and practice.

4

WEST STOW SFB 1.6: 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 9 small timber halls surrounded by 69 sunken-featured buildings or grubaenhauser. In addition to providing a model for Early Anglo-Saxon settlement, the site also yielded an extensive collection of animal bones and fragments. This paper will focus specifically on SFB 1.6 in order to address specific questions of Early Anglo-Saxon animal husbandry, settlement, and society.

West Stow SFB 1.6 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 Anglo-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 cast coin engraved with runes inscriptions of the kabbalistic acronym Aga gala gala gala lag – Daus meus – aga gala gala lag tell us about medieval life in a small town by the Baltic Sea in Sweden? The context within which an artifact is found is of crucial value for how to interpret both the item and the context itself. What about the artifacts 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 town’s council square, which means that the context was not optimal. By using a biographical approach in combination with etymology and historical sources the interpretative value of the artifact 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 1262) 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

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.

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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.

8

"WHEN THE LOOP IS BROKEN" - A SECONDARY HOLE IN THE MEDALLION FROM ONIEW (POLAND) AS AN EXAMPLE OF RECYCLING

Abstract author(s): Michalik, Jakub (Nicolaus Copernicus University in Toruń)
Abstract format: Oral

The subject of the paper is a medallion with the image of St. Joseph Calasanz and the Priest shield. The medallion comes from the archaeological research in the church in Gniez (Poland) which took place in 2012. The medallion was found in the burial located in the church’s nave.

The medallion parts are of “decoitional items” group across sides, scarapels, 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): Martín Seijo, María (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 case of Hoyos de los Herreros (La Rioja, 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.

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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 Beia.

10

SILK POUCH FROM A CULTURAL LAYER OF MEDIEVAL MOSCOW

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. Textile sources, particularly those generated as part of the religious or secular rituals surrounding death, 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 standing of the way individuals negotiated periods of change and constructed their social identities through material culture. On the other hand, the cloth may have served as a way of collecting the alms of the deceased, with the proceeds being used to fund charitable enterprises. The cloth was therefore a multi-faceted object, serving multiple functions in both the secular and religious spheres of late medieval England.

11

THE IRONMONDERS’ PALL: HEARSE CLOTHS, POSTMORTEM IDENTITY, AND THE REFORMATION IN ENGLAND, 1400-1600

Abstract author(s): Rakonczay, Rita (Eötvös Loránd University, Institute of Archaeological Sciences)

Abstract format: Poster

The research of the Hungarian hearse cloths was fundamentally grounded by two finds that were discovered in Banská Bystrica in 2015. The first find, from the 15th-16th century, was a hearse cloth that was located in a workshop area. Later, a similar find was discovered in a workshop area of a later date. The textile was found to be an important part of the workshop activities, as evidenced by the presence of a small scale inscribed with figures that are similar to those found in workshop areas of other regions. The second find, from the 16th century, was a hearse cloth that was found in a workshop area of a different region. The textile was found to be an important part of the workshop activities, as evidenced by the presence of a small scale inscribed with figures that are similar to those found in workshop areas of other regions. The two finds provide important insights into the production processes of these cloths and the social context in which they were produced.
by the presence of Livelle pottery within the Yemena graves of the Tisz-a region in eastern Hungary. Early Bronze Age ceramic vessels of Carpathian provenance have been found in Yemena contexts even further to the East, which demonstrates the networking between the Balkan-Carpathian and Yemena societies in the first half of the 3rd millennium BC.

2 THE BEGINNING OF MIDDLE BRONZE AGE IN SOUTHEASTERN TRANSYLVANIA

Abstract author(s): Psuská, 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 steppes meet, resulting in a particular cultural material. A similar case can be traced during the Middle Bronze Age (MBA), when contacts between the Transylvanian Wartenberg culture and the Moldavian Monteuros 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 Costişa/Domorant culture (located north of the Monteuros culture, still in Moldavia) infiltrated, resulting in a later appearance of the Wartenberg communities. This Costişa/Domorant "domination" is based on two settlements, known until now in Transylvania and a few ceramic fragments discovered on some Wartenberg sites. Research of the last decade shed light on a different situation. A lot of Monteuros ceramics were identified in museum deposition, documents and even in excavations. Several systems of classification and typological groups of vessels across the region were identified and published. Recent field surveys identified new spots with this type of pottery from other settlements. This reflects a gradual development from the Monteuros culture to the Wartenberg and a possible appearance of several phases of construction-destruction-reconstruction of surface houses built in the wattle and daub technique in a confided space. Nevertheless, considering the chronological differences, several unique characteristics were identified for each site.

3 TRANSITION IN MOTION. EXPLORING THE LINKS BETWEEN CHALCOLITHIC AND BRONZE AGE IN THE MIDDLE DANUBE VALLEY

Abstract author(s): Staniek, Robert (OCR 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 format 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 stratified occupation remains which, compared with other results, hopefully will soon bring the question to an end.

4 INSIGHTS INTO POTTERY TECHNOLOGY AT THE EARLY BRONZE AGE FORTIFIED SETTLEMENT IN SIPSÍSKY SŤVROTK

Abstract author(s): Drávková, Dominika (Institute of Archaeology of the Slovak Academy of Sciences) - Perfil, Ján (Department of Geological Sciences, Faculty of Science, Masaryk University)

Abstract format: Oral

The pottery of the 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-expressed 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, craftsmanship, and consumers?

The operational sequence and production traits of the fineware and coarseware pottery can be reliably traced at the intra-site level through the assemblage from the fortified settlement in Sipsísky Štvrtok. While micropetrographic and chemical analyses of the final products testify to the forming methods and techniques. Results indicate, that some of the certain shapes hindered by the divergent forms of occupation and material culture different from 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.

5 POTTERY COMPARISONS BETWEEN TWO CONTEMPORARY HORIZONS OF NEIGHBORING BRONZE AGE TELL-SETTLEMENTS (ŞIANTONI AND TOBOLIŢU)

Abstract author(s): Dögőtan, Florin (Institutul de Arheologie si Istoria Acta Olă Napoca; Universitatea de Vest din Timişoara) - Liu, Marius (Institutul de Arheologie baslu) - Fazecos, Grușa (Muzeeul Turist Clujului 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 Şiantoni Dealul Mănăstirii and Dobolbă Dâmbu Zănăcanului that are located approximately 7 km from each other.

The C14 samples collected from the uppermost Bronze Age layers at Şiantoni yielded a result comparable with the one from the lowest levels at Tobolii, thus showing a possible synchronicity between the two dated archaeological horizons. Although the site from Şiantoni started to be inhabited earlier than the one from Tobolii, both of them follow a similar pattern of Bronze Age tell-site formation (multi-layered settlements with several phases of construction-destruction-reconstruction of surface houses built in the wattle and daub technique in a confined space). Nevertheless, considering the chronological differences, several unique characteristics were 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 and/or 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 MURES 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 chronological artifacts, contexts, and cultural phenomena is strongly influenced by the existence and number of available AMS dates. In order to answer pressing needs, we shall put forward the elaboration of a chronological system of the Late Bronze Age in the Lower Mures Basin, a key micro region of the intra-Carpathian area. As a phenomenological benchmark of this geographical area one should mention the definition 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 available chronology has created and still creates numerous confusions among those who research these archaeological reality. In order to surpass this problem, and in order to provide some explanations for the processes of cultural evolution, we 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 Mures 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 we 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): Kocov, Adela (Botocani County Museum)

Abstract format: Oral

One of the most frequent methods of identifying people is dactiloscopy, which is based on analyzing the features of the papillary ridge pattern. Papillary ridge pattern is made up of ridges and grooves that form papillary drawings whose appearance is formed during the intrauterine period of the fetus. The sustainability of the use of this method is given by the uniqueness and stability of the drawings of the papillary ridge, which, besides its several characteristics regarding the placement, their shape and size. The characteristics exclude the repeatability of a certain papillary type and elements of the papillary ridge drawings are stable over time. Papillary traces are created as a result of direct contact between the papillary ridge and a support. When the support is smooth and relatively hard, the papillary traces are surface and can be created by strafification / de-strafication depending on the transfer process of the substance that reproduces the papillary pattern. When the support is plastic the papillary ridge is reproduced in depth and the papillary traces made in this way can be preserved for a long time. The investigation of objects of cultural heritage is made in criminology using light sources with variable wave lengths or with the possibility of changing the angle of incidence. The phalaeic 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
This work is supported by grant scheme VEGA No.1/0100/19.
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 Maxauleum is a useful case study for understanding the complex development of Turkic cultural heritage politics. The Maxauleum is a unique monument in 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.

3

AKSOMICROSS THE GLOBE: THE COMPLEXITIES OF ANCIENT TRADE ROUTES AND TRANSREGIONAL HERITAGE TODAY
Abstract author(s): van Aardt, 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 800 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 access to such transregional archaeological heritage nowadays. The archaeology of these networks, particularly, remain scattered across several countries, challenging the feasibility of defining 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 China and Africa. While neglected in historical reviews in the past, recent findings increasingly show that the Aksumite Empire was an influential and crucially situated African center (current-day Ethiopia and Eritrea). Its main port of Adults, especially, functioned as a 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 Sooptra, Oman, Gujarat (India), and even in the ancient ports of Sri Lanka (Anuradhapura).

So far, these have predominantly been studied per sites or regions, while a transregional understanding of their spread and impact does not yet exist. This paper reports on the first steps we have taken to address this. We have taken into account 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 century. The second part of this paper will focus on the resulting current issues of heritage management as integral component of our research.

4

LOCALISATION VIA CULTURE: CREATIVE MEDIUMS FOR A CO-PRODUCED HERITAGE BASED TEACHING
Abstract author(s): Termini, Konstantinos (University of Bristol) - Fernées, Christianne (University of Bristol)
Abstract format: Oral
Heritage applications in educational contexts 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 Cultures” the process of creative media for producing local and global heritage assets to be used for teaching in the classroom. The educator is the facilitator who leads the students through transformative applications to bring the heritage that surrounds them with the aim to create the teaching material for their own lessons. Cases 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.

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ARCHAEOLOGY AND ARCHAEOGEOGRAPHY OF GLASS, 6TH TO 13TH CENTURIES CE: POSSIBILITIES OF ARCHAEOLOGICAL AND HISTORICAL INTERPRETATION OF MAJOR GLASS TYPES
Theme: 6. Theories and methods in archaeology: interactions between disciplines
Organisers: Tomkou, Katerina (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Herold, Hajnalka (Department of Archaeology, University of Exeter)
Format: Regular speech
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 importance of glass production in NW Europe. The questions this 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.

1

GLASS NETWORKS: TRACING EARLY MEDIEVAL LONG-DISTANCE TRADE, C. 800–1000 CE
Abstract author(s): Harold, 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. Smalle-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, 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 those connections. But, while studies of the chemical compositions of early medieval glass from the Mediterranean and north-western Europe are available, those two regions have not been linked together by data from those areas that lie between. This project investigates glass artefacts with archaeological and scientific methods, from these routes and their simultaneous local-global nature as evident from their archaeological remains. 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 lack 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 glass factories allowed us to reconstruct the pioneering of the early medieval craftsmen who mobilised 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 antiga natron glass for special productions or mixing natron glass and wood ash glass. High lead and wood-ash lead are rare in France, but their exceptional discovery is also symptomatic of this period of mutations of the glass industry.

RESILIENCE AND MUTATIONS OF THE GLASS PRODUCTION IN FRANCE BETWEEN THE 8TH AND THE 11TH CENTURY AD
Abstract author(s): Pactat, Inês (CEB - IRRATI UMR 5060 - CRN/Université de Dijon)
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 lack 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 glass furnaces allowed us to reconstruct the pioneering of the early medieval craftsmen who mobilised 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 antiga natron glass for special productions or mixing natron glass and wood ash glass. High lead and wood-ash lead 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 ARCHAEMETRIC EVIDENCE
Abstract author(s): Colagelli, 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 (SICTRANS and GLASSROADS), we have conducted the first systematic study of Sicilian glass assemblages in terms of their chronophylologial and compositional characteristics. Preliminary findings reveal a chronological evolution of the repertory of glass forms as well as differences in consumption and
economic dynamics between Slavic urban and rural centers. Furthermore, the study contributes to the knowledge of extra-regional trading networks in which the island was integrated, and how these changed over time in relation to changing institutions. Our study presents new trends in the consumption patterns of glass similar to other Slavic regions, especially for the period between the 6th and the 11th century. On the other hand, when Sicily was part of the Islamic world during the 10th and the 11th century, the circulation of goods and typological models was closely related to the territories of the Fatimid caliphate. In the 11th century, in contrast, Sicily was firmly integrated into the productive koinè of Mediterranean Europe characterized by a high typological homogeneity. Given the wide chronological scope of our study, data for the 4th and the 12th century are still being evaluated.

LEAD GLASS IN EARLY MEDIEVAL BOHEMIA. CONTINUITY OR DISCONTINUITY?

Abstract author(s): Tomković, 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 are found near the horizon with the jewellery of the Great Moravian tradition. Before the year 1000 there are only beads, especially irregular seed beads and polyhedral 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 glas 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.

ON THE ISSUE OF MEDIEVAL HIGH-LEAD GLASS IN EASTERN EUROPE

Abstract author(s): Václava, Světana (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 finds was found in the Middle Volga region. Their attribution is based on a morphological and technological data.

Examples are glass of double-layer glass with a camo-style decor from the 10c. In Belgor, Byzantine beads and bracelets from the 11 to the early 12 centuries, Russian beads and bracelet of the 12-13 centuries from the cities of the Volga Bulgaria. The most numerous are the Byzantine beads of the 11-12 early century. It is possible that in the XI century there was a workshop of incomplete production cycle on imported glass “B” in money 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. Robert (2019). Other authors (Lomonosov 2011) can observe that high lead content glazes which are low-melt glazes with the firing temperature around 700–800°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 glass items were also found 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 has been successfully used in the era of the Middle Ages in Poland and Central Europe.

MEDIEVAL WOOD-ASH LEAD GLASS: NEW FINDS FROM YAROSLAVL (RUSSIA)

Abstract author(s): Stolyarova, Ekaterina (M. V. Lomonosov Moscow State University) and Valiulina, Svetlana (Kazan Federal University)

Abstract format: Oral

These are stained glass dated from 12th to 15th centuries. The closest analogies to these complexes were found in museum collections. Our study also identified trends in the consumption patterns of glass similar to other Russian regions, especially for the period between the 6th and the 11th century. These finds from Yaroslavl allow to extend to the east locations at which the wood-ash lead glass were found and state the existence of cultural and/or trade relations between German-speaking areas and Rus in general and Rostov Principality in particular.

EARLY TO HIGH MEDIEVAL GLASS HOUSES FROM CENTRAL EUROPE. THE PROBLEM OF FUNCTION AND SOCIAL SIGNIFICANCE

Abstract author(s): Pankowicz, Aleksandra (University of Wrocław)

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.

HIGH-LEAD GLASS AS A GLAZE IN EARLY MEDIEVAL POLAND 11TH-13TH CENTURY

Abstract author(s): Sliamionowiska, Sylwia (Institute of Archaeology and Ethnology of the Polish Academy of Sciences) - Pankowicz, Aleksandra (Institute of Archaeology at the University of Wrocław) - Sadowski, Krzysztof (·) - Rozsinsz, Paweł - Stoszyk, Henryk (Ceramics & Glass Reconstruction and Restauration Department, The Eugeniusz Geppert Academy of Fine Arts)

Abstract format: Oral

The 11th-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 was glass jewellery (finger rings and beads) made of high lead alkali and non-alkali glass. At the same time this type of glass was 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 archeological contexts from the 11th-14 centuries. Comparing the glasses of ceramic vessels formed using early and late medieval techniques, we can observe that high lead content glasses which are low-melt glasses with the firing temperature around 700–800°C were replaced by lead–alkaline glasses 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 glass to the ceramic body. In the early Middle Ages, other glass 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 has been successfully used in the era of the Middle Ages in Poland and Central Europe.

EARLY TO HIGH MEDIEVAL GLASS HOUSES IN THE UPPER WESTER REGION, GERMANY

Abstract author(s): Wilke, Detlef (Dr. Wilke Management & Consulting GmbH) - Stephan, Hans-Georg (Institut für Kunstgeschichte und Archäologien Europas, Archäologisches Mittelalter und der Neuzzeit, Martin-Luther-Universität 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 Bodenfelder at the right bank of the Weser River. Most probably this hut worked in connection with the nearby Benedictine monas-try of Corvey, which was granted imperial rights about Bodenfeld in 839. In Corvey relics of Carolingian period working relating to glass making were discovered. The Institute of Archaeology of the Karamlin (Russia) the context of the finds enables them to be dated to the period prior to the Mongolian invasions, and to connect them to the construction of the stone-built Assumption Cathedral, which was dedicated in 1215 by Grand-Prince of Rostov. The glass of such composition is rarely found in Rus’. In fact, we know only a handful of objects made from this type of glass. None of them include stained or window glass – primarily they are ornaments. This kind of glass was not, apparently, manufactured in Rus’, where other techniques of glass-making were employed, primarily using specially-treated ash such as potash (lead-ash glass) and high-lead glass. These finds from Yaroslavl allow to extend to the east the locations at which the wood-ash lead glass were found and state the existence of cultural and/or trade relations between German-speaking areas and Rus in general and Rostov Principality in particular.
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 Crowey and the nearby Benedensteine abbey of Heilmarshausen, 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 droplets and drippings as well as characteristic pot sherds, but often without finished glass relics are difficult to be addressed as to which type of glass recipes has been applied there. The absence of finished glass relics 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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CLASS OF 13TH CENTURY: PITFALLS OF ARCHAEOLOGICAL AND ARCHAEOMETRIC STUDY OF FINDS FROM NW BOHEMIA

Abstract author(s): Černá, 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 the 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.

11

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 in large number of medieval glass finds in several northern countries. Like stoneware, glass was frequently imported to the Baltic market. 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 unlock 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 interaction 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 wood fire in the furnace environment and temperature regulation; and then 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 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): Strašičková-Štúrová, Danica (-)

Abstract format: Oral

In the year 2017 we reconstructed a glass furnace from the 910th centuries in the archaeological park at Hanulovce nad Topľou according to the find Devinšinska 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 Elsam and Aspaam (present-day Australia) 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 those 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

Themes: 5. Theories and methods in archaeology: interactions between disciplines

Organisers: Balbi, Jose Nicolás (Secretaría de Cultura y Educación, Buenos Aires; Colchester Archaeological Group) - Iwanisze

Abstract format: Oral

The study of landscapes and skylines 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 of the landscape? 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, geology, 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 OZARÓW - MIERZANOWICE MICROREGION OF THE MIERZANOWICE CULTURE

Abstract author(s): Iwanisze

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 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, as also 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 “Zagórów”, was also heavily exploited. Archaeological research revealed the functioning of workshops near the mining activity. The excavated mining activities display a different set of human-environment relationships. There could be found 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 skylscape to describe the ways in which the Early Bronze Mierzanowice peoples could have 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 Arqueología Escuela Nacional de Antropología e Historia - Instituto)

Abstract format: Oral

An abundant anthrohistorical, ethnographic, and archaeologic record links the Central Mexican Atlatlanups with skylscape. While elevated mountaneous peaks and ridges have been viewed as animated and sacred, the ritual places located within the skylscape were visited on occasions to be enmeshed, along with other aspects of the environment. Ritual activities in Mesoamericana coordinated the 365-day vague calendar with the 260-day divinatory cycle, producing ritual periods divided up into groups of days, 4, 6, 7, 9, 12, 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 dependent 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 into 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 calendric markers in the region of Amanonaca, State of Mexico.

3 TATABUELO-SAN MARCOS AND THE PILGRIMAGE TO THE SACRED HILLS: THE RITUAL LANDSCAPE AND ITS MYTHICAL SUSTENANCE IN AZOYU, 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 Tlapae in the municipality of Azoúy, Guerrero State, on the Mexican side of the Pacific Ocean. Here, the ancestors 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 Sanabuehuan 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 artesia lies, understanding how the existence of a sacred geography has remained throughout the centuries. Making an interdisciplinary study between archeoastronomy 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 solstices. From this we can relate the cognitive elements with the movement of the Sun throughout the day and at night through an ancient interpretation of the pre-Hispanic codices in which Edvard Adler 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 Protoclassic 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 skylscape.

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) - Coronado, Gustavo (FCNyM - Universidad Nacional de La Plata)

Abstract format: Oral

Our work will reveal an astronomical astronomy perspective of this important site which is the greatest Inka construction south of 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 Shinchal de Quimiví 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 calen- dric mithrae, 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 Inka architects. In our case of study, within the great square, a particular structure has drawn our attention, a large wall of 56 meters in length divided into five segments which corresponds to each of the four divisions and built with selected ledged rocks. We will discuss this astronomical phenomenon, the context of the Inka site and the similarities with other ritual and power centers of the Inka Empire, studying the possibility of astronomical observance contexts, calendrical calculations and the possibility that the construction constitutes an ancient solar meridian.

Bibliography:
- Taylor, G. 1999 “Ritos y tradiciones de Huascarón”. Lima, IREA.

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 12th century. Researchers began in a cultivation field where an ancient burial of two individuals was found. The group responsible for the cultural and historical heritage of the city, the Colchester Archeo logical 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.

Bibliography:

THE POWER OF LIGHT AND DARKNESS: THE ILLUMINATION PHENOMENON OF CUEVA MERINEL (BUENOS AIRES, ARGENTINA)

Abstract author(s): Machuca López, Sonia (Departamento de Prehistoria, Arqueología e Historia Antigua, Universitat de València, 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 València), 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 lands 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, Cuervo Meinal 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 inside the space. However, there is one area from the central antechamber, which seems to have been artificially modified, that would only be illuminated during a short amount 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: G. Theories and methods in archaeology: interactions between disciplines
Organisers: Zamboni, Lorenzo (University of Pavia) - Bar-food, 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 underemphasized miniaturization, considering their products only as mere simplifications, as means of ritual and ritual practice, or as cheap reproductions of normal-sized objects. In objects a reduced scale is 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? Miniaturization does not imply devaluation, but rather a change in function and value. Is there a semantic 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 archaeology and in anthropology, beyond the boundaries of disciplines.

ABSTRACTS

1 MINIATURE OBJECTS AND MINIATURIZATION: A NEUROSCIENCE-HUMANITIES APPROACH

Abstract author(s): Pitt, 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 functioned 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 efficiency 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 ATTACHED WITH THE INCA RITUAL OF CAPACOCHA

Abstract author(s): Siemianowska, Iwlya (Institute of Archaeology and Ethnology of the Polish Academy of Sciences; El Centro de Estudios Andinos de la Universidad de Varsovia en el Cusco - CEAVUC) - Perea Chavez, Rudy (Museo Sanborns 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 pottery forms found in both monumental and domestic contexts. By compressing details, and miniature objects, forms 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 1996-1997 by J. Reinhard and M. Zárate. The first individual (famous Juanita) was discovered out of situ and in disarray some 70 m below the remains of the summit platform (5662 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 Misti on the ceremonial platform approx. 5300 m by J. Reinhard and A. Chavez. They found 2 graves with 2 ceramic sacrifices in each one and 8 to 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 36 from Misti were found. The archaeological material from this two sites is in the collection of Andean Sanctuaries Museum in Arequipa.

3 LIVING IN THE SMALL WORLD. CREATING ATTITUDES IN POST MEDIEVAL, MODERN AND CONTEMPORARY GDANSK

Abstract author(s): Dabul, Joanna (University of Gdańsk)
Abstract format: Oral

In this paper author will present selection of miniature items including those made of clay, metal and wood. The collection of miniaturized objects has been excavated in Gdańsk urban area. Most of them were found at archaeological sites located in housing areas, canals and fortresses. With use of contemporary archaeological abstract figures those archaeological finds will be visualised 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 be possible to conceptualising other than material world on the bases of small things. The general idea of implemented discussion based on presentation of archaeological finds from Gdańsk is how much we can tell us to 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): Dowen, 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, shrines, and manufactoring 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 650 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 containing 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 phenomena, 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 revisited their archaeological contexts and the function of some pieces, adopting an interdisciplinary approach which mixes archaeology and anthropology. I used concepts, such as affinities, quotidian and semiotic ideology (see Davy 2017) combined with the analysis of the findsheets, to explain the possible function of some miniature ingots in the Late Bronze Age Cypro-Cotriot society.

During my work within the framework of the RToE ‘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 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): Spith, Maria (Society of Messenian Archaeological Studies)

Abstract format: Oral

Thousands of miniature vessels came to life 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 permits 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 sacred 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 ABBERA, AEGEAN THRACE, FROM THE ARCHAIC TO THE HELLENISTIC PERIOD

Abstract author(s): Motisiou, Paraskevi (National Kapodistrian University of Athens)

Abstract format: Oral

Extended excavations during the years 1992-1999 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 study 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 tombs cemeteries at this 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, sapulchr 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 hydria from the sanctuary of Domatar bear 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 Terramara 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 further un听见terpretation 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 Vola, 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-Etruscan Apennines in Northern Etruria and the Samnite-Lucanian Apennines in Southern Samnium (Hephaestus). 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 payed 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 (TROSIGNONE, ITALY): A PRELIMINARY STUDY ON MINIATURE WEAPONS AND BRONZE SHEET FIGURINES

Abstract author(s): Murazzi, 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 Pescarolo Sanctuary in Casalvieri (Trosignone, 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-Casanean 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 Early Etruscan deposits of the Eraclea sanctuary. During the later phases, the miniaturization was replaced by the offering of real weapons, according to the Helleno-Roman traditions. Since this phenomenon is well known at Sabatino 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: Balfour, Paul (Clwyd-Powys Archaeological Trust) - Almansa Sanchez, Jaima (JAI Arqueología) - Foreman, Penelope (Clwyd-Powys Archaeological Trust)

Format: Session with precinctulated papers

Europe is divided. Nations and nationalities and identities are drawn, redrawn, refused, 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 neitherapolitical nor apathetic in the face of these changes and challenges. 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 to hold a wider debate on its value and impact upon both archaeology and the public perception of social issues in Europe today.

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 reimagines 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) - Marończik, Arkadiusz (Adam Mickiewicz University in Poznan) - Vanika, Pavel (University of West Bohemia)

Abstract format: Oral

The EU funded Horizon2020 project Community Archaeology in Rural Environments Meeting Societal Challenges (CARE-Misc) 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-Misc 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 developments 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.

This paper presents new data from surveys developed by an international team of psychologists and archaeologists working together on the CARE-Misc project, in which participants’ responses were recorded before and after the excavations, and compared with non-participating control groups surveyed at the same times. Analysis shows measurable, statistically significant differences between participant and control groups in a range of specific attitudes related to community, place, attachment, esteem and well-being. We will suggest that this method, whose inferences can be compared with responses from post-participation interviews, offers a novel, robust approach to measuring the personal, wellbeing, and cultural impacts of participative community archaeology, in different cultural contexts, in four different European countries. We suggest that this can help the heritage sector better substantiate its claims to benefit society, including in ways which enhance wellbeing and social cohesion, and in so doing, should ultimately help make such benefits more widely accessible in the future.

3. DIGGING THROUGH PARTNERSHIPS AND COMMON GROUND

Abstract author(s): Ooiken, 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!

4. ‘HOPE IN THE DARK’: CREATIVE ARCHAEOLOGIES AS POLITICAL INSIGHT AND ACTION

Abstract author(s): Hannis, Joda (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 both within 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 that positive change is prefigurative and sends’ 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!

5. NAVIGATING CLIMATE CHANGE CULTURE: THE IMPORTANCE OF ZOOARCHAEOLOGY IN THE DISCOURSE OF EXTINCTION

Abstract author(s): Paguay, 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 and actions can lead to the destruction of our world. Zoological archaeology presents a unique lens with which to view 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 presents new data from surveys developed by an international team of psychologists and archaeologists working together on the CARE-Misc project, in which participants’ responses were recorded before and after the excavations, and compared with non-participating control groups surveyed at the same times. Analysis shows measurable, statistically significant differences between participant and control groups in a range of specific attitudes related to community, place, attachment, esteem and well-being. We will suggest that this method, whose inferences can be compared with responses from post-participation interviews, offers a novel, robust approach to measuring the personal, wellbeing, and cultural impacts of participative community archaeology, in different cultural contexts, in four different European countries. We suggest that this can help the heritage sector better substantiate its claims to benefit society, including in ways which enhance wellbeing and social cohesion, and in so doing, should ultimately help make such benefits more widely accessible in the future.

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6

IDENTITY AS PEDAGOGY: A CASE STUDY IN SOCIALLY ENGAGED ARCHAEOLOGY

Abstract author(s): Slovenska, 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 curatorship. This discussion will focus on the development of the course and the potential for socially engaged archaeology to benefit not only the students who participate in the course, but also the wider public. The paper will draw upon the experiences of the first cohort of students and reflect on the challenges and opportunities that arise from engaging with a pedagogy of curatorship.

7

FINDSAMPO - A COOPERATIVE CITIZEN SCIENCE PLATFORM TO MANAGE AND CURATE ARCHAEOLOGICAL FIND DATA IN FINLAND

Abstract author(s): Valkola, Ville (Finnish Heritage Agency)

Abstract format: Oral

Findsmapo (Fi. Läytysmapo) is a web portal under development in Finland for archaeological finds made by public, particularly by professional metal detectorists. The database is developed by the Finnish Archaeological Finds Recording Open Linked Database (OaLiT) 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 management and handling of digital data. 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): Ráska, Zoltán (Castle Headquaters Integrated Regional Development Centre Nonprofit Ltd.)

Abstract format: Oral

Oroszlás 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 providing guidance on the obligatory documentation techniques.

9

PUBLIC ARCHAEOLOGICAL ORGANIZATIONS ON THE BORDER OF EAST AND WEST

Abstract author(s): Göbor, Béla (Herzian Orttó 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 successful initiatives, as well as collaborations that are taking shape even in these days.

10

COMMUNITY ARCHAEOLOGY INITIATIVES IN EASTERN EUROPEAN COUNTRIES

Abstract author(s): Volklik, 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 those 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 those 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.
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 faience 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 prestigious luxury goods, were instrumental both in enhancing and maintaining a logic of social competition among elites 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. FROM MEDITERRANEAN TO CELTIC PRACTICES OF ALCOHOLIC CONSUMPTION: THE CASE OF THE ETRUSCAN CALDRON OF THE PRINCELY GRAVE OF LAUVA

Abstract author(s): Frau, Dominique (Université de Bretagne Sud) - Barbier-Pain, Delphine - Dubuis, Bastien (INRAP) - Garnier, Nicolas (LUG) - Dodinet, Elisabeth (Université de 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 ensemble 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 wines, Conifer pitch and beeswax, (2) a low number of pollen grains from limes (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.

A MEDITERRANEAN ORIGIN OF GALLO-ROMAN BABY BOTTLES, MEDICAL CARE AND FUNERAL RITES?

Abstract author(s): Jaggia, Sandra (HISOMA, Lumière, Lyon 2; TEMOS T emps, Monde, Sociétés, Université de Bretagne-Sud) - Garnier, Nicolas (LUG) - Chercheur associé ADORC ORIS 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 farther 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 body is more or less long, wide or thin, the base 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 debat ed.

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 vessels hint at a common cultural practice in the Mediterranean? In which case, which objects were used in the different phases of the individual’s life? Did the beaker vases, which were then “romanized” in Gaul, participate in the cultural assimilation process? In this way, we can discover the way in which Mediterranean cultural practices were conveyed to the local populations. Did these objects play a specific role in the individual’s life? Did they convey the cultural values of the Mediterranean world? If so, how did they spread? Could they have been used in a different way? These are all questions that are still to be answered. The results of analyses of the contents of these feeding bottles are promising, and help us understand the uses and the role of these objects in the Mediterranean world.

THE "SEVEN AGAINST THEBES" IN THE ETRUSCAN CINERARY URNS: MODELS OF ASSIMILATION AND TRANSFORMATION OF A GREEK MYTH

Abstract author(s): Gluiam, 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 monothematic perspective. In this sense, the transmission of a particular myth, even if secondary to the primary carrier, possesses a particular value, making it evident that the features of a given myth represent a constant factor, further complicates the hermeneutic framework, often making it difficult to read, both in the diachronic 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 repertories of the Greek world, but still 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 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 funerary 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 Ilios as a palaeo-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): Doden, Elisabeth (University of Southern Brittany - UEB - TEMOS) - Garnier, Nicolas (Laboratoire Nicolas Garrier) - Barbiere-Pain, Delphine (RIHAP - Université de Bretagne Sud - USB, Université LàOs Sciences Océan UMR-CNRS 6530) - Marinval, Philippe (CNRS - ASM - Archéologie des Sociétés Méditerranéennes)

Abstract format: Oral

The famous hypogeum of the Greek city of Poseidonia (Paestum), excavated in 1954 and dated from the end of the 6th c. BCE, has been interpreted as a haven based on the archaeological material retrieved. It encompassed 5 iron rods (clavii) wrapped in a thick mass of bronze (necropodium) from a woolly fibre (tragopetra) in the centre, 1192 copper objects (hydria, amphora) and of an Antonine, decorated with black figures, set along the north and south walls of the structure. The walls and the bottom of the bronze hydria and amphora were covered by 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 used as a heroic cult to the founder of the city. Yet, the different sets of analyses performed during the 1950s and 1960s, although they could not identify the nature of the fatty substance, has 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 resin, nor plant pitch, but rather the markers of a siccative oil. The extracted pollen was dominantly that of Cannabaceae (e.g. Cannabis hemp) or Humulus (hop) (CIM). 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 MONTE PRA MA (SARDINIA - ITALY): WHICH INTERACTION?

Abstract author(s): Fere, Dominique - del Mastro, Barbara (Università Bretagne Sud - USB, Université LàOs Sciences Océan UMR-CNRS 6530) - Usai, Alessandro (Soprintendenza Archeologia, Belle Arti e Paesaggio per la città metropolitana di Cagliari e le province di Oristano e Sud Sardegna) - Garrier, Nicolas (Laboratoire Nicolas Garrier)

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 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 culture in the island. In particular, 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 MISSTRAD LAGOON (SARDINIA, ITALY)

Abstract author(s): Musella, Maria (Università degli Studi di Cagliari) - Selinas, 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 palaeo-beach; 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 ceramological 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 Egyptological remains found in the excavations, some fragments of manufacured 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 FUNICURY CONTEXTS OF THARROS: OBSERVATIONS ON THE REPERTOIRE AND USE

Abstract author(s): Dal Vai, 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 (7-5 cent. BC). In this period the ceramics attested are Etruscan-Cothintian cups and aryballoi, Ionic cups and Etruscan bucchera; these vessels seem to have a specific function in the context of the funerary 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 Carthaginians. In this case it is difficult to understand if they had a specific function within the funeral ritual or if they are only valuable funeral offers. When the Attic productions disappear in the Western Mediterranean at the end of the 4th cent. BC, they are replaced by imitation potteries that reproduce 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-cultural type, linked to their agelogen origin.

10 GREEK MANUFACTS IN THE PUNIC TOMBS OF TUVIXEDDU (CAUGLIO)

Abstract author(s): Ciri, Michela (Università 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 funerary kits, it was nevertheless possible to identify the most resonant ceramic forms, 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 Pedio Ibba, in which are reported the lots of materials recovered in each of the more than 150 hypogeas 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 cultural context or if they were simply valuable objects deposited in the tomb for the sake of 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 Superintendencies ABAP for the metropolitan city of Cagliari and the provinces of Oristano and South Sardinia.

11 ICONIC STELAE AND CIPPIT IN ROMAN SARDINIA: ONE MORE CASE OF CULTURAL HYBRIDIZATION

Abstract author(s): Angiulli, Simona (Università di 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 stea, but there are also cippit, urns, come from Tharros, Sardara, and Baunei. All of them are made in local stone and are decorated with a very iconic 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 Sardinian areas where they were found and we will look for similar works in the whole Italian territory and in the Mediterranean lands.
MULTI-PERIOD LAND-USE IN CENTRAL SICILY 13TH CENTURY BC TO 13TH CENTURY AD

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 Nuragic period to the Roman one, the meaning of the funerary evidence is related to the particular Nuragic cultural tradition and the new ideological patterns coming from Rome. Indeed, the presence of the Nuragic tradition is demonstrated by the funerary and epigraphic evidence from the area. The persistence of the Nuragic tradition is observed by the funerary and epigraphic evidence from the area, and is confirmed by the funerary monument with the funerary monument in Cagliari (southern Sardinia), comparable with some Nuragic funerary towers monuments. Concerning the Roman cultural tradition, more specifically, the presence of the Parisian 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 ocula” 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 geographic closeness 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 archaeology of death interact with each other in Sardinia from the late Roman period to the Imperial one.

RELIGIOUS AND CULTURAL INTERACTIONS IN ANCIENT LICURIA AND CORSE (IRON AGE AND ROMAN PERIODS): NATIVE HERITAGE AND OUTSIDE DEVOTION INTAKES

Abstract format: Poster

Investigating the religious landscape in ancient Licuria 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 and scattered hints of possible native 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: Licuria and Corsica are, in fact, both strongholds of native identities and external civilizations crossroads; nevertheless, evidence about local devotions are weak and scattered. From this starting point we try to verify some mechanisms of interaction or reaction among the religious imagery and the related forms of devotion carried by the natives here, and the external intakes. Here, differently from the next areas of the Southern

ACCUMULATIVE INTERACTION AND SOCIAL TRANSFORMATION IN IRON AGE AND ARCHAIČIC WESTERN SICILY

Abstract author(s): Balco, William (University of North GeorgiaDepartment of History, Anthropology, and Philosophy)

Abstract format: Oral

Late Iron Age and Archaičic western Sicily was a nexus of social interaction, entangling indigenous Dorian 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 reimagining of these ideas and objects is best exemplified among comimonial funerary 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 comimonial 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 employs method 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 TÀS SILI

Abstract author(s): Saponara, Antonella (Independent Researcher) - Isernaro, 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 archaeological record. 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 evidences of Phoenician cultural tradition and the new ideological patterns different from the local production. The phenomenon in the Maltese Maltese pottery production is present, but less direct, above all in connection with the introduction of the typical characters of Phoenician ceramics; considering the current state of research, the real imitations of Phoenician 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 paper is aimed to act as the basis for the research of a huge account of the pottery from a dump context in sanctuary of the first cent. A.D, when close to the Augustan age a modiolus in Italic Sigillata from the Pisan workshop of M. Perennio appears. The presence of these objects 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 Carmona and about its use and function. This contribution aims to identify some 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 Balearic territory, suitably evaluated at light of considerations also of a commercial nature.

THE LOCAL GODS. THE CULT OF THE THREE NYMPHS IN THRACE

Abstract author(s): Amiranova, Marius (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 context. 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 developing iconographical scheme and the surviving inscriptions point to a unified naming convention. However, the votive tablets have developed iconographical scheme and the surviving inscriptions point to a unified naming convention. However, the votive tablets have
Oral, 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 consistency of the allogemic presences like Greeks and Etruscans (after all, well documented as trading partners whenever not as inhabited enclaves like at Genoa or at Aleria) 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 necropoles 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 permutation among the different human elements settled here, at least until the overwhelming Romanization.

185 MORPHOLOGICAL DIVERSITY IN ARCHAEOLOGY. DATA EXPLORATION AND VISUALIZATION BY GEOMETRIC MORPHOMETRICS

Theme: G. Theories and methods in archaeology: interactions between disciplines
Organisers: Csipak, Péter (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Borel, Antony (Olistria Naturelle de l’Homme Préhistorique - HNHP, Museum national d’histoire naturelle, CNRS, UPVD, Paris, Étela Loránd University, Institute of Archaeological Sciences, Budapest)
Format: Regular session

Abstract format: 3

**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, Irisa (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 derived from 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, 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-Petronic, Vera (National Museum Belgrade) - Sands, Rob (University College Dublin)

Abstract format: Oral

This paper explores the role of equivalent 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 objects 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 its typological and morphological-variation of early copper axes and the relationships between the earliest copper axes their stone counterparts (skauomorphic). The basis of our study is a digital comparative analysis of copper and stone axes found within limita culture sites in Serbia (5th millennium BC). We also include observations on contemporaneous assemblages from neighboring 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, as well as how the practices to economic, prestige and symbolic processes enabling the complex transformations of the transitional late Neolithic / Chalcolithic period.

3 PHYLETIC SERATION OF EXPERIMENTALLY PRODUCED ANTHROPOMORPHIC FIGURINES: AN EXERCISE IN MORPHOMETRIC ANALYSIS

Abstract author(s): Radinovic, Mihailo (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Petilj, 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 he/she 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 phylitical analysis. 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 Ellicitic 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 phylitical analysis, and assessing similarities and dissimilarities in figurine shape.

4 POTTERY TYPOLOGIES, REPRESENTATION AND MORPHOMETRICS

Abstract author(s): Cantisiani, Mattia (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 classifier 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 malleability of the human past. As a matter of fact, understandings of artefact variability that build upon taxonomies and representativeness have been debated, while seasonal engagements with archaeological datasets often become the focus of sustained scholarly examination and examinations that privilege experiences and practices over meaning, chronology and content. Instead, this paper argues that a theoretical understanding of experience and practice in archaeological discourses can also come from an "anthrochoric" 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 way to explore new social boundaries. Eventually, I will discuss how we can conceptualize social embryonic 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): Srbavov, Alina - Purčiová, Zuzana (Department of Archaeology and Musaeology, Masaryk University)

Abstract format: Oral

The ceramic vessels from necropolis No. II were redocumented within the ongoing revision of archaeological material from necropoles belonging to the roman military castell with civil background. It is the best researched one and has the highest informative value not only through archaeologilal, but also anthropological material. Therefore for the purpose 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 rites for morts 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 visualizations 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.
6  MORPHOMETRY OF ROMAN MILITARY BRICK STAMPS: FUTURE OF THE STAMP CLASSIFICATION?

Abstract author(s): Janak, 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 the 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 detail. 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 Mullov-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): Samara, Beatriz (Catalan Institute of Human Paleopathology and Social Evolution – IFPES, Tarragona; University of Barcelona, University College Dublin) - McCay, Ashley (School of Archeology and Earth Institute, University College Dublin) - Dal Bosco, Antonetta (Catalan Institute of Human Paleopathology and Social Evolution - IFPES, Tarragona; University of Roma and Virgili, Tarragona) - Cos, Jüdith - Csengere, Piroska (Department of Archeology, Herman Ott Museum, Miskolc) - Kall, András (Vakkiapatnyus Nonprofit Co., J.) - Dombóczky, László (National Centre for Castello Miss, Eger) - Andrés, Alexandra (Institute of Archaeological Sciences, Eszter László University, Budapest) - Foekeny, Robin N.M. (School of Medicine, University College Dublin) - Pinhasi, Ron (Department of Evolutionary Anthropology, University of Vienna)

Abstract format: Oral

The transition of 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 genetic 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 palaeoanthropology 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 (703573) 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): Fenner, Christianne (University of Bristol; University of Southampton) - Rosbin Brown, Kata (University of Bristol) - Zakowski, Siobín - 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 archaeoanthropological 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 1272/1276 and a Nikon XTH 920, at a resolution of 17.5-65μm. 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 ecosensitive. The causes of these changes will be discussed in relationship to 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.
IN TEXTILE LAYERS. WRAPPED HUMAN REMAINS, ANIMALS AND ARTEFACTS IN THE NILE VALLEY FROM PREHISTORY TO THE EARLY MEDIEVAL PERIOD. PART 1

Theme: 6. Theories and methods in archaeology: interactions between disciplines

Organizers: Ivanova, Elisa (Centro per la Ricerca e la Restaurazione del Carattere Storico del Tesoro); Brandt, Luisa (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 wrappings were used to an ever-shrinking 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 ethnozoology, biology, 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 forefront of current research with a newly defined methodological model.
The deposit of the mumification 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 sliver of various types. These were used to cover fingers, toes, and the parts of the deceased’s corpse. Furthermore, the deposit also contained 900 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 deposit are various large bandages, a shroud, a fringed sheet, netted 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 repatriary found in the embalming cachette, as well as the technical procedures and religious acts implied in the mumification 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.

4 CLOTHING USED AS WRAPPING MATERIAL IN BURIALS FROM THE NECROPOLIS OF FAG EL-GAMOUS

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 those burials consist mostly of sheets of undyed linen folded around the body. Of those burials with sufficiently preserved textiles to observe, approximately 61% have contained clothing fragments as part of the burial ensemble. Of this small number, only 15% 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.

5 ARE THREE 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. Wierzbik 1988, “Stapahghe, Shalen and Grabpagty of the Dritten Zwischenzeit und der Spätzeit” and Taylor 1998, “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 most cases, 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 external surface. Then the cartonnage case was decorated. Although cartonnage cases as such were only in use until the early 26th Dynasty, inner wooden coffins of the 26th and 25th 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 role. As part of our investigations on two areas. The first goal is a better understanding of the part played by textiles amongst religious practices and burials. The second goal is to present 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.

6 RE-SHROUDING THE PAST: RECONTEXTUALIZATION OF MUMMY SHROUDS FROM GRAECO-ROMAN EGYPT WITH DIGITAL 3D MODELING

Abstract author(s): Fasih-Bush, Susanna (University of California, Berkeley)

Abstract format: Oral

Validated for their naturalistic portraiture, painted mummy shrouds from Graeco-Roman Egypt were often striped 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 re-wrapping techniques. Furthermore, the deposit also contains 900 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 deposit are various large bandages, a shroud, a fringed sheet, netted 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 repatriary found in the embalming cachette, as well as the technical procedures and religious acts implied in the mumification 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.

7 WRAPPING THE DEAD IN MEROMIC SUDAN: A FIRST OVERVIEW

Abstract author(s): Vranz, Elisa (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 at 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 Merotic (c. 300 BCE – 350 CE) and Postmerotic (c. 350 – 550 CE) cemeteries excavated in the 1960s. UNESCO’s Nubian campaign, which has provided exceptionally rich textile collections curated today in museums across the world. A small number of scholarly works has since espoused 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 Merotic funerary practices. Covering a vast territory, the Merotic royalty brought under its unifying authority a myriad of different population groups. Despite the widespread attestation of Merotic 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 Merotic Kingdom. Overarching funerary archaeology and textile research, it will propose a method to incorporate archival, textile, and modern archaeological practices to trace those fleeting but very meaningful gestures.

8 A BIFOCAL APPROACH OF THE HUMAN AND ANIMAL MUMMIES FROM EL-DEIR, KHARGA OASIS, IN THE WESTERN EGYPTIAN DESERT

Abstract author(s): Lellett-Willemen, Fleur (DRHMA MA 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 textile documentation of animal 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 precisely their development and changes on a site like El Deir, for a long, complicated period, from Persian, Greek and Roman times, till Christianism settled in the Middle East. We are 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.

9 THE ECONOMIC AND RELIGIOUS ROLE OF WRAPPING OF ANIMAL MUMMIES IN ANCIENT EGYPT – A CASE STUDY FROM SAQQARA

Abstract author(s): Brandt, Luisa (GLOBE Institute)

Abstract format: Oral

Several large catacombs for animal cults have been uncovered throughout Egypt. Recently, the Catacombs of Anubis at North Siwa have 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 thelean consumption for the mummy, the paper argues that the animal cults must have required a large and continuous supply of linen for mumification. 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 embalming 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 wrapping of the figurines sometimes reflects the costumes known from iconography, but sometimes they are simply fragments of textiles thrown onto the figurine.

In order 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 wrappings 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.

TOWARDS AN INTEGRATED APPROACH RELYING ON CHARACTERISATION AND RADIOCARBON DATING FOR THE STUDY OF TEXTILES FROM ANCIENT EGYPT

Abstract author(s): Ferranti, Maria (Sorbonne Université, CNRS, laboratoire MONARIS - UMR 8233, Paris, Institut Français d’Archéologie Orientale - IFAO, pôle archématéria, La Cairo) - 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

This research project 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 chronological 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 old 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 imprinted on the textile (waxes, oils, resins, pigments, bitumen...) and such substances can potentially 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 underestimation of the "true" textile age.

Thanks to a preliminary development on test samples, promising results have been obtained from textiles from ongoing Egyptian excavation sites, especially from Luxor necropolises. We will see how organic substances can be identified and extracted from the textile and if the extraction methods tested allowed good radiocarbon accuracy in our case. We will also discuss the importance of good conditions in the lab (artificial ageing, reference materials...) to understand the states of deterioration encountered in real archaeological samples. Future works will also be detailed, such as new coprobes to study and new extraction methodologies to adapt to archaeo- logical textiles.

THE MANY LAYERS OF THE ZAGREB MUMMY WRAPPINGS

Abstract author(s): Gieba, Magda (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 1980’s the radiocarbon date came back as 390-210 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 mumification, or in the 3rd century AD – by the dealers 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 linen itself 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 “CAMBIA” FROM THE MUSEO EGIZIO DI TURIN: CONSERVATION TREATMENT AS AN ENHANCEMENT OF AN ARCHAEOLOGICAL TEXTILE

Abstract author(s): Bussagoc, 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”.

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The garment, currently inside out, is a simple cloth made of eight pieces of plain weave linen, sewn together. The neckline and cuffs may be representative of a hitherto un-found first stage of decarnization prior to reburial. Minimal osteological evidence of an earlier may be representative of a hitherto un-found first stage of decarnization prior to reburial. Minimal osteological evidence of an earlier...
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) - Lilie, 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. 3990 calBC (the 5.9 klyear 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 3930 calBC, subsequently extending to all corners of Europe and beyond. This transformation was associated with, and, in all probability, carried by the people of the Yamnaya culture complex (YCC) and their relatives and descendants. The period leading up to the formation of YCC is an enigmatic phenomenon. Nowadays we have at our disposal more than 60 radiocarbon dates coming from barrow graves, generally from the eastern part of the steppes and allowing to position the earliest "Yamnaya" graves around 3100/3000 BC. However, slowing down to pristine graves from Thrace (6 chronologies and 1 cremation) and 4 graves from North-East Bulgaria (all inhumations) pre-date "Yamnaya" horizon dating to the timespan 3000 – 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.

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) - Abola, 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 as a mark on the landscape that is still visible nowadays. These mounds were either built to flat steppe landscape or on top of previous occupation horizons. 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 steppe 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. Those mounds were either built to flat steppe landscape or on top of previous occupation horizons. 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 those phenomena are known especially through burial structures, our focal point will be in mortuary archaeology. However, instead of placing our gaze solely to the obvious – the traces 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 mortuary remains of the Yamnaya and subsequent archaeological complexes of the 3rd millennium BC. 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 interface. We can confirm the three-stage periodization of the Pit-Grave culture: the early (Ripine) stage – 3970-3500 BC, the advanced (classical) stage – 3300-2600 BC with two A and B steps – 3300-2950 and 2950-2600 BC, and the late (Poltava) stage – 2600-2300 BC. The work is performed for the project RFBR № 18-09-40031.

AN OVERVIEW OF SOME RECENT EXCAVATED YAMNAYA BURIALS FROM DOBRUDJA, ROMANIA
Abstract author(s): Stefan, Cristian-Eduard - Vasile, Sandu-Gabriel ("Vasile Pârvan" Institute of Archaeology, Romanian Academ- y)
Abstract format: Oral
Due to the rescue excavation made in the last years in Romania on sites belonging to big infrastructure projects (highways, awolian turbines) we have been able to reveal a significant number of Yamnaya burials, many of them being discovered in Dobrudja, 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 Dobrogea is a very important way of communication between the north of the Black Sea and the Balkans, the fact being proved also by the mounds scattered in the landscape. We gathered the data available from five sites (Aliman, Cernavodi, Modigida, Rahm 1, Rahm 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.

FROM WEST TO EAST: INTERACTION BETWEEN COPPER AGE CARPATHIAN COMMUNITIES AND YAMNAYA GROUPS SEEN IN THE FUNERARY RECORD

Abstract author(s): Cugudean, Horia (Muzeeul National al Unii Alba Iulia) - Quinn, Colin (Anthropology Department, Hamilton College) - Back, Jess (Anthropology Department, Vassar College) - Uhner, Claes (Romisch-Germanische Kommission des Deutschen Archäologischen Instituts) - Hansen, Svend (Europäisches Abteilung des Deutschen Archäologischen Instituts).

Abstract format: Oral

Current research has consistently 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 discovery 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 little in common with 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 network in the interaction between local and Yamnaya societies in the 3rd millennium BC. The deposition of the Copper Age Coloured pottery in the pit-graves of the earthen mounds east and south of the Carpathians is evident that the Yamnaya represents a 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.

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 “Khortytsya”).

Abstract format: Oral

Among numerous synonyms for “Yamnaya culture” there is one that precisely reflects the phenomenon altogether with the problem 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 ochre 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 Mykhailivka settlement is very different to Generalka 2 site on Khortytsya 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 causawayed 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 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.

CORD IMPRESSED DECORATION ON POTTERY AND YAMNAYA CULTURE IN SOUTHEASTERN EUROPE

Abstract author(s): Senimoto, Masao (University of Tsukuba).

Abstract format: Oral

This paper discusses the transmission of cord impressed decoration on pottery from archaeological sites of Yamnaya and Indo-European peoples in southeastern Europe, based on the analysis of typological-technical and chronological perspectives. The cord impressed decoration on pottery appeared in the Balkan-Carpahan 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 bellows. The older limit of the cord impressed decoration on pottery from them can be dated back to around 3500 cal BC.

APPROACHING THE INTERCONNECTION BETWEEN YAMNAYA, GLOBULAR AMPHORA AND CORDED WARE PEOPLES

Abstract author(s): Heyd, Volkert (University of Helsinki).

Abstract format: Oral

Recent ancient DNA and archaeological research has highlighted the importance of the whole Yamnaya-Corded Ware-Belaeker complex in an ethnic, social and cultural upheaval covering all of Europe in the 3rd Millennium BCE. However, we are only at the beginning of comprehending what kind of transmission has happened between Yamnaya and Corded Ware peoples, and what is the role Globular Amphora people therein who seem to have concurrently, between 3500 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, i.e. of steppe versus forest steppe; river systems embracing into other ecoclines; 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.

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, Volkert - Preda-Balanica, Bianca (University of Helsinki) - Franculeasa, Alin (History and Archaeology Museum of Prahova Department - 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 BCE, 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 palaeogenetic studies have been added, which show that these two cultural complexes are very similar with regard to the biological populations and ways 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 palaeogenetics 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.

TWO ORIGINS OF THE CORDED WARE SOCIETIES IN SOUTHEASTERN POLAND

Abstract author(s): Wlodarczak, Piotr - Szczepanek, Anna - Jaroń, Paweł (Institute of Archaeology and Ethnology, Polish Academy of Sciences).

Abstract format: Oral

The funerary 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 the Corded Ware graves: burial mounds and catacomb constructions. To a lesser extent, this relation was documented by material culture certificates in the area, but also from the settlements. The older limit of the Corded Ware decoration on pottery from them can be dated back to around 3500 cal BC.

This analysis enables us to identify similarities and differences of the Corded Ware decoration in the Kurgan burials and the settlement west of the Pontic area and to discuss their chronological position. By this, the paper illustrates the factor that the Corded Ware decoration brought to the Balkan-Carpahan area from the Northeast Pontic area does not necessarily result only in Yamnaya. Furthermore, by examining the process in which the cord impressed decoration spread to the Balkan-Carpahan area in the 3rd millennium BCE, 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.
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 site in the younger phase of the South-Eastern Corded Ware, including the specific nature of grave inventories.

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THE EMERGENCE OF THE CORDED WARE CULTURE IN THE SOUTHWESTERN BALTIC
Abstract author(s): Schulthies, Sebastian (Institut fuer Ur- und Friehheitsgeschichte 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 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 neoliths 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 CWC-societies re-used megalithic tombs of the FBC regularly. This is especially true for the southwestern part of the Ombian Peninsula. In this area, moreover, a FBC-ceremonial 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 presented that demonstrate continuities between FBC and CWC, which have been widely overlooked. For this purpose, battle axes will be highlighted.

In the southeastern 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 DALFSSEN: FROM TRB TO CORDED WARE CULTURE: INVESTIGATING CONTINUITY IN TIMES OF CHANGE IN THE NETHERLANDS
Abstract author(s): Van der Velde, Henk (RAC Archeopjcten; 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 dated the TRB – CWC 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 during the TRB – CWC period was customarily individual oriented than previously thought.

Although differences are visible the parallel 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.

FOREIGN – LOCAL INTERACTION: THE CASE OF GRAVE Nº 30 FROM THE BURIAL MOUND NEAR VILLAGE OF MOGILA, YAMBOL REGION
Abstract author(s): Volchev, Todor (Regional Historical Museum - Yambol)
Abstract format: Poster

At the end of the 4th millennium BC’/’nergia 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 is 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.
copper mining and smelting, as well as socially significant uses of metals in burial. All major (and most minor) ore bodies from Tuscany and neighboring regions were characterized 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 western-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 central-western Italy participated in supraregional 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-west 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 supraregional trade networks that came into being in the Bronze Age.

**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, Sapientia 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 ore in deposits and lead to a characteristic Cu isotope 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 isotope composition of the ore. This was previously investigated for malachite ores but investigation for the much more widely used cuprite ore was lacking. The combination of oxidative roasting and reductive smelting provides very beneficial conditions for Cu isotope fractionation to occur.

To investigate the behaviour of Cu isotope, a series of archaeological smelting experiments was carried out. Six of the ores 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, the influence of fluxing materials. Hence, it does not affect applications of Cu isotopes directly on the metal but has various implications for the applications of Cu isotopes on the material, which is most abundant and most likely available for analyses from archaeological sites: the waste products. 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 (4526 individually inventorised samples). The samples originate from 503 mines (and gravel mines). Mocanec to Holocene age sediments. 146 recent river bars, and 99 gravel and boulder samples of older alluvial channels. Each sample was separated into 5 or 6 size fractions (more paramagnetic, more diamagnetic, and residual light minerals). All samples were sorted for the clay fraction. The collection was established for reconstructing the sedimentation history and for the identification of mineral, but it is applicable for the reconstruction of the stratigraphic sequence and for the identification of the source of the clay. The samples 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 this contribution, applicability of the comparative method is demonstrated via examples from Egypt and the archaeological ceramic record of Hungary.

**PROVENANCE STUDY OF POLISHED AND GROUND STONE ARTEFACTS IN THE CARPATHIAN BASIN AND ITS SURROUNDING FROM AN ARCHAEOLOGICAL PERSPECTIVE**

**Abstract author(s):** Sislagy, Kuta (Mora Ferenc Museum) - T. Bir, Katalin (Hungarian National Museum) - Szilágyi, György (Eötvös Loránd University) - Péterdi, Bálint (Mining and Geological Survey of Hungary) - Ginsburg, Veronika (Centre for Energy Research)

**Abstract format:** Oral

The main goal of this paper is to present a new interdisciplinary 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 decades archeometrical 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 goal 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 us 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 quantifies 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 relevant 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?

**PROVINCING CERAMICS BY HEAVY MINERAL INVESTIGATIONS AND ROLE OF THE MICROMINERALOGICAL COLLECTION OF THE MINING AND GEOLOGICAL SURVEY OF HUNGARY**

**Abstract author(s):** Sislagy, Szilagyi, Veronika (Centre for Energy Research) - Peterdi, Bélint (Mining and Geological Survey of Hungary)

**Abstract format:** Oral

Provenance studies of archaeological potteries 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 clast material type (region of source). 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 (4526 individually inventorised samples). The samples originate from 503 mines (and gravel mines). Mocanec to Holocene age sediments. 146 recent river bars, and 99 gravel and boulder samples of older alluvial channels. Each sample was separated into 5 or 6 size fractions (more paramagnetic, more diamagnetic, and residual light minerals) fractions. Originally, the collection was established for reconstructing the sedimentation history and for the identification of potential raw material territories is the key to the successful provenance determination. In this contribution, applicability of the comparative method is demonstrated via examples from the archaeological ceramic record of Hungary.
A DEVIANT GROUP OF CAROLINGIAN/OTTOMAN PERIOD DISC BROOCHES FROM THE NETHERLANDS, EXPLORED USING NON-DESTRUCTIVE PXRF

Abstract author(s): Roxburgh, Marcus Adrian (Leiden University)

Abstract format: Oral

Aspects of the production and exchange of Carolingian/Ottoman disc brooches are discussed through an interdisciplinary analysis of 29 disc brooches from across The Netherlands. Their compositions selected from across The Netherlands and The Netherlands and resulted in a set that showed a sharp deviation from the alloys used in brooches from earlier periods. The results across all geographic areas provided a picture of the samples distribution. In the Nordic region, the brooches were scattered over the entire range of cinnabar concentrations, indicating that the samples were sourced from different and possibly distant regions. The results of this study suggest that the distribution of these brooches can be attributed to the interaction between local and non-local producers, where the non-local producers are likely to be associated with the production of high-status artefacts.

A better fit.

DISCOVERING NEW TENDENCIES IN THE NORDIC BRONZE AGE BASED ON LARGE-SCALE METAL PROVENANCE ANALYSIS, 2100-1300 BC

Abstract author(s): Noergaard, Haidei (Aarhus University, Dep. Culture and Society) - Pernicka, Ernst (Curt-Engelhorn Center for Archaeometry) - Vandelis, Helle (Aarhus University, Dep. Culture and Society)

Abstract format: Oral

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 the development of metal trade and exchange. To better understand how metal trade was conducted, we analyzed the metal composition of metal artefacts to determine their origin and provide insights on the flow of metal between different regions.

PROVENANCING METAL AND GLASS IN THE IRON AGE. HOW TO SCIENTIFICALLY APPROACH “COMPLEX ECONOMY”?

Abstract author(s): Stefanski, Damian (Archaeological Museum in Krakow) - Glasscock, Michael (Archaeometry Laboratory, Research Reactor Center, University of Missouri) - Plasky, Bogumił (Auschwitz-Birkenau State Museum) - Źrałka, Jarosław (Institute of Archaeology of the Jagiellonian University)

Abstract format: Oral

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 came from 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. A crucial goal of the investigation was to determine the exact sources of obsidian and try to reconstruct trade connections Na

OBSIDIAN ARTEFACTS FROM THE PRE-COLUMBIAN SITE OF NAKUM (PETEN, GUATEMALA). PROVENANCE, PROCESSING AND FUNCTION - RESULTS OF PRELIMINARY ANALYSIS

Abstract author(s): Silesarov, Vechení (Cluster of Excellence ROOTS, Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

In the 3rd mil. BC territories between the Baltic Sea and the Black Sea were covered by multi-cultural and multi-directional contact system. The Visuwita – 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 technologies and new technologies forced people to provide new solutions for them, building new social organizations and structures. New knowledge, new technologies and new economy systems led to increasing of mobility of different societies which often caused high tension between them and inside. In the literature related to intercultural interactions we can find mentions of the existence of flint material from far-distance outcrops, 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 visionary selection of researchers. It is common to call greyish-brownish coloured flint “Volhynian”.

Nowadays in modern archaeology researchers came to the same conclusion that from the ethnological view at science it is needed to provide non-destructive and non-invasive methods to protect single artefacts and archaeological heritage in general. In 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 generate 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.

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14 IRON FROM THE NETHERLANDS: CAN WE PROVENANCE EARLY HISTORICAL DUTCH IRON USING SLAG INCLUSION CHEMISTRY?

**Abstract author(s):** Koopman, Inseke (Cultural Heritage Agency of the Netherlands)

**Abstract format:** Oral

In 2009, the BNC was invited to CHARISMA project (2009-2014), as the sole fixlab provider offering neutron methods. A continuous line.

Budapest Neutron Centre successfully took part in NMI3 projects of the 5th, 6th and 7th Framework Program, offering access to

In the 6th Framework Program, there was a continuation called EU-ARTECH, with Italy, Greece, UK and Germany. The major task was

PROJECTS

PARTICIPATION OF THE BUDAPEST NEUTRON CENTRE IN THE EUROPEAN HERITAGE SCIENCE

Additionally, apparent changes in the texture of cementite is related to the thermal history of their manufacture.

One of our aims is the detailed study of the Oriental Arms and Armour of the Wallace Collection which contains nearly one thousand

Considering lithic artefacts, which have a well-defined, constant chemical composition over long historical times, it is promising to

ARCHAEOLOGICAL MATERIAL

The present archaeometric study focuses on the siliceous lithic industry, a total of 43 samples (tools and débitage) dated to the

ARCHAEOLOGICAL MATERIAL

APPLICATION OF CFE-SEM-EDX AND OPTICAL MICROSCOPY TO NEOLITHIC SILICEOUS TOOLS FROM ȘOIMUS-TELEGHI SITE (HUNEDOARA COUNTY, ROMANIA)

**Abstract author(s):** R. Reed, E. Bâzău-Bolyai University, Department of Geography and History, Faculty of Geography and History, Department of History and Archaeology, Section of Prehistory and Archaeology - SERP, Barcelona - Ionescu, Cornelia (Babeş-Bolyai University, Department of Geological Engineering, Cluj-Napoca; Kazan Federal University, Archeological Technologies & Archeological Material Sciences Lab., Tatarstan) - Barbat, Ioan Alexandru (Museum of the Dacian and Roman Civilisation, Deva) - Barbu-Tudoran, Lucian (Babeş-Bolyai University, Department of Biology, Cluj-Napoca)

**Abstract format:** Poster

(Soimus-Teleghi) (Soimus village in Hunedoara County, Romania) is an Early Neolithic settlement dated between the end of the 7th millennium BC to the beginning of the 6th millennium BC. In 2011, preventive archaeology surveys were conducted by several Romanian institutions, as The Museum of Dacian and Roman Civilisation (Deva), the “Vasile Păruș” Institute of Archaeology and the National Museum of Romanian History (both in Bucharest), within the “Deva-Orăștie Highway project (south-western Transylvania)”. The present archaeological study focuses on the siliceous lithic industry, a total of 43 samples (tools and débitage) dated to the Starčevo-Criq 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 radiolite, chart, fissiliferous chart, 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 characterization 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.-I.-S acknowledges the support of the Romanian Ministry of Research and Innovation (UEFISCDI/ONCISOR) project PN-III-P1.1.1-PDO-2016-0859.

b. APPLICATION OF NEUTRON-BASED METHODS IN PROVENANCE RESEARCH OF LITHIC ARCHAEOLOGICAL MATERIAL

**Abstract author(s):** Kasztovsky, Zsolt (Centre for Energy Research) - Birs, 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 Lithotech 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 from fingerprint data from the main sources. Case studies of Croatian, Serbian and Romanian archaeological obsidians are presented. Another successful project aims to identify possible geological outcrops of polished stone tools made of metamorphic rocks (granulite, blueschist, hornfels, etc.) and to compare them with geological units in the surroundings.

Provenance study of silice, 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 silice (e.g. flint, radiolite, chart, etc.) in their composition. countries and the USA. In this project, every country is represented by national hubs. Hungary is represented by the Atómki, to which the Centre of Energy Research is linked, as a “third party.”

Since 2016, the European Research Infrastructure for Heritage Science (E-RHIS) preparatory project takes place on the “ESFRI Roadmap.” The aim of E-RHIS is to ensure integrated, in-kind, sustainable access for heritage scientists to the leading European research centres. Hungary is represented by the Atómki at E-RHIS, with linked third parties of the DK, Wigner and the Hungarian National Museum. The final aim of these networking is to create national centres of heritage science in Europe.

15 NEUTRON TECHNIQUES AND THE ANALYSIS OF ARMS AND ARMOUR

**Abstract author(s):** Williams, Alan - Edga, David (The Wallace Collection) - Grazzi, Francesco (CNR Italy) - Scherillo, Antonella (ISIS Neutron Source, Harwell) - Rosta, Laszlo - Kài, Gyorgy - Kasztovsky, Zsolt (Budapest Nuclear Centre)

**Abstract format:** Oral

Traditional metallurgy is well-suited to the analysis of plate armour, and is micro-invasive. However, it is less suitable for swords, because their constructive 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 continent.

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 wrought (so-called “Damasco 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):** Kasztovsky, 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 belong to the H2020 Grand Challenge priorities.

The European Community has launched the first Heritage Science thematic project in 2001, called LABES 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 NMI 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 2005 and 2010, our PGAA laboratory took part in the ANCEST CHARM project, aimed to develop a new technique called PGAA-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 IPERON Oh (2015-2019). At last, IPERON Hi will be in 2020 with the participation of 21 European

parton Analysis, K-means clustering, Linear Discriminant Analysis etc.), combined with empirical observations can be the most ef

The results show the great variability of the manufactured siliceous rocks and demonstrate that the prehistoric communities knew very well the lithic sources in their environment.

The mineralogical and petrographic characterization 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.-I.-S. acknowledges the support of the Romanian Ministry of Research and Innovation (UEFISCDI/ONCISOR) project PN-III-P1.1.1-PDO-2016-0859.
The 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 RIS project 18/78-1-L0079.

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 SAPIU) - Basile, Martina (Sapienza University of Rome) - Repola, Leopoldo (Sapienza University of Rome)

Abstract format: Oral

The mobilier art of Grotta Romanelli (Lecco-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; there are also zoomorphic figures (Azanfara 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 inspection of the microscope analyses with the 3D modelling reveals that the engraved traits are sometimes superimposed and that there can be a number of figures almost invisible without the synergy of different approaches.

3. THE VENUSES OF PARABITA (LECE, APULIA): FOR A RECONSTRUCTION OF THE PREHISTORIC ARTISTIC GESTURE

Abstract author(s): Basile, Martina (Sapienza University of Rome; University of Valenca) - Lamoniti, Cristina - Zampetti, Daniela (Sapienza University of Rome) - Repola, Leopoldo (Sapienza University of Rome)

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 1965 at the “Nicola Fuzzi” Cave in the territory of 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, focusing on the use of new integrated methodologies involving experimental archaeology and the analysis of technological traces. Archaeological experimentation 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 on 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 genetic 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.
5

ENGRAVING LIMESTONE ROCKS: EXPERIMENTAL AND USE-WEAR ANALYSIS APPROACH

Abstract author(s): Lopez-Tascón, Cristina (Universidad de Oviedo)

Abstract format: Oral

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. In this communication I present a study about the engraving techniques of the Asturian rock engravings. The rock selected was Cala de Montañar, rock-paint in the wall of most part of art sites spread along the Nalón river (central area of Asturias). Experimentation allows 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 taxonomic approach to analyze experimental tools used in the reproduction of palaeontological engraving. The main objective consists in checking if these lithics tools present use-wear traces and if it is possible to characterize and define it.

6

THE HOLISTIC APPROACH TO THE CARIBBEAN ROCK ART STUDIES

Abstract author(s): Juszczky, Karolina (University of Warsaw)

Abstract format: Oral

Rock art studies are varied and their realizations are made up of many approaches that determine which methods and tools can be used. However, the biggest difficulty 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 helps me to distinguish 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.

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NETWORKS OF INTERACTION AND COMMUNICATION: PATTERNS OF EMERGING COMPLEXITY

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

Organiser: Schlicht, Jan-Eric (Institut für Ur- und Frühgeschichte, Kiel University) - Danchenko, Alekssandr (National Academy of Sciences of Ukraine, Institute of Archaeology)

Format: Regular session

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 focus on the ‘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 develop 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. 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 patterns to evolving complexity. We encourage contributions to the following issues:

• Behavioral patterns produced by interaction/communication networks;
• Description and modeling of complex dynamic behavior;
• Distinction between external and internal driven forces in systems behavior;
• Approaching cycles in development of complex systems;
• Theoretical contribution of complexity to archaeological method and theory.

Papers dealing with related, but not listed issues, are highly welcome as well.

1

TWO DIFFERENT LOGICS? QUESTIONS OF ONTOLOGY AND HOLISM IN THE FACE OF SYSTEMS-REPRESENTATIONS AND INFERENCE IN ARCHAEOLOGY

Abstract author(s): Schlicht, Jan-Eric (Kiel University)

Abstract format: Oral

Three different notions stemming from (old and recent) discussions on archaeological/anthropological and social theory form the basis for this paper:

• The notion of societies being complex dynamic systems, producing complex dynamic behaviour that is to be modelled through quantitative means.
• Increasingly prominent approaches to regarding human life, culture, identity, action, etc. as products of highly interlaced strands of interaction, as for example with the concept of Transculturality.
• 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.

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.

2

INITIATION RITUES DURING THE AUSTRONESEAN DISPERSAL

Abstract author(s): O’Brien, Michael (Texas A&M–San Antonio)

Abstract format: Oral

Kinship systems, flexible through time, were integral to the process of evolution of complex societies, directing modes of cooperation and interaction 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 I explore the co-evolution of initiation rites and kinship systems in early AustroNeesian societies, whose putative matrilocal origins contrast with the patriliny-patriclality in most other early agricultural societies worldwide. Previous work used phylogenetic comparative methods and ethnolinguistic information to infer matrilocal 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 phylogenetic trees in ancestral Austronesian societies, similar to previous analyses on marital residence, socio-political organization, and human sacrificial rites in those societies.

3

CAPTAIN: WHAT WE’VE GOT HERE IS FAILURE TO COMMUNICATE

Abstract author(s): Zubrowska, Ezra (University of Toronto and Buffalo)

Abstract format: Oral

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. 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. After answering these two questions, it examines what inevitable failure might mean in the archaological record with substantive examples taken from the Old World. The title is from the movie “Cool Hand Luke”
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 focusing 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.

5 CYCLICAL BEHAVIOR OF PREHISTORIC CULTURAL SYSTEMS WITH STABLE INDEPENDENT FORCING

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 internal forcing 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 records. 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 propelled the development of multi-ple 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 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. 6500 - 4500 BC) to guarantee their survival, taking into account the actual archaeological record as a prior 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 socioeconomics 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 human beings. Material culture examinations, among many other problematics, contribute to evaluate through time and space the phenomenon of interaction, communication, networks, behaviours, and the process of changing/preserving traditions. Prehistoric material culture and technological processes related to human cognitive development and to the necessary know-how to organize team and networks. The advent of a more holistic approach to the analysis of material culture has been a turning point to better understand prehistoric technological achievement and paradigms, widening the scenario of our prehistoric ancestors behaviour and complexity. Examples from Upper Paleolithic occupation layers from Grotta Cavanna (Sicily) and from the Mesolithic layers from Grotta Coraggi (Sicily) will be discussed, more precisely data from functional analysis (residue and use wear trace) combined with techno-morphology and ecological data will be presented to draft many questions and some answers to past human behaviours and dynamics.

8 RECONSTRUCTING MESOLITHIC SOCIAL NETWORKS FROM THE IBERIAN PENINSULAR USING ORNAMENTS

Abstract author(s): Cucurut-Mora, Carolina - Romano, Valeria (Instituto Universitario de Investigación en Arqueología y Patrimonio Histórico - INAPH, Universidad de Alicante) - Lozano, Sergio (Departamento de Historia Económica, Instituciones, Política e Economía Mundial, Universidad 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 brings to the work developed within the Paleocom (ERC-started 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 were 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 microstructural 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-Puerta, Joaquín R - Bernabeu Aubán, Joao (Departamento de Prehistoria, Arqueología e Historia Antiga de la UEDV)

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 and 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 assert 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 radioactive carbon 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.

10 EXPLORING ROOTEDNESS AS A SOCIAL STRATEGY FOR CULTIVATING FAR-FREACHING NETWORKS: RE-EXAMINING TØBy WMAN 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 Øby 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 plaques 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 contiguity theory and Gibrat’s concept of “footlooseness” 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 displays a strikingly de-centralized, 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, exported 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 vitality.

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. Multi-level 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 objects. Still debatable are the 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 abstracts focusing on quantitative analysis of SPAM 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 those approaches.

1 3D APPROACHES TO THE DOCUMENTATION OF WEAR TRACES ON EARLY NEANDERTHALS WOODEN ARTEFACTS FROM POGGIETTI VECCHI, ITALY

Abstract author(s): Florido, 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 – Poli, Marzia (Cyprus Institute - STARC) – Santaniello, Fabio (Università degli Studi di Trento) – Revadini, 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 Neandertal groups which inhabited western Italy during the late Middle Pleistocene. Indeed, wood- en 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 several times by the first hominins. 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-and- wear 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 Neandertal’s 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): Florido, 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) – Revadini, 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 optical 3D scanning technology, wear and residue analysis. Residue analysis has the potential to provide a reliable basis for reconstructing the operational chain of artifacts 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 the “Palaio-Diet”, a bilateral project between the Cyprus Institute and the Russian Academy of Science and the project “PLeU – Plant Use in the Palaeolithic”, a cooperation between the IFP (Italian Institute of Prehistory and Protostory) 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 sampling 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 Maio, Gianpiero (Neandertal 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. Since its running is since 2018, the project aims at creating a 3D digital catalogue of Palaeolithic 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 digital repository. At the present, ca. 600 artefacts 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 the latter has experienced a long and apparently irreversible period of stagnation.
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): Birklund, 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, a 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, Jeffrey (Stuart 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. 3D 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 3D in an accurate technique of rock art documentation, as opposed to other more subjective methods, and its value for Feldwork. We will reflect on the contribution of 3D 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): Dobrowolska-Ludwin, Joanna - Rosłucki Bałk, Karolina ( Jagiellonian University in Krakow)
Abstract format: Oral

We live in the age of visuals. It should not surprise than that the general need for seeing rather than reading reaches archaeology, too. However, digital visualisations are usually seen as “pretty pictures,” good for popularization of archaeological finds and more effective fundraising, but not a part of “real” archaeological analyses. Raising on our field experience we will try to break the cliché. The Polish Archaeological Expedition to the Nilo Delta has excavated the site of Tall el-Fekha 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 IIIIB (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 elision of a Predynastic tomb, as well as spatial development of the cemetery.

Because even the brightest tales has a dark motif, and if 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 future epigraphic studies.

The work carried out by the Polish-Egyptian team began in 1965. 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 were preferred. Then, based on orthophotos, 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 minimizing 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 ‘Dialogue’ grant programme of the Polish Ministry of Science and Higher Education (008/DLU/2017/12).

8 3D APPROACHES IN PALEOGRAPHIC RESEARCH – THE CASE OF CYPRO-MINOAN WRITING

Abstract author(s): Polig, Martina (STARC, Ghent University) - Harmon, 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 a 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 corpus 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): Hubry, 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 (fingerprint 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 fixed 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 access a much wider range of sex-linked features. These include the measure of ridge thickness to valley thickness (RVTVR), "secondary crease" frequencies (commonly 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 artefacts. Modern Greek ceramics are both genetically and occupationally close to those we get to their ancient predecessors. The technique will make it possible to rigorously evaluate longstanding archaeological questions, including the sex (and as a result the genders) of producers of ceramic figurines, ceramic tablets, and ceramic sculpture.

THE INFLUENCE OF MODERN TECHNOLOGIES ON OUR PERCEPTION OF HUMAN REMAINS. NEW TECHNOLOGIES/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 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.

REVITALISATION OF VIKING AGE BOATHOUSES, WITH THE USE OF 3D TECHNOLOGY

Abstract author(s): Nytn, 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 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 medieval Nordic early towns (koppstaden), so that the visualisation of the 3D models is a best possible way to get to 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-visualisation, the case of revitalisation was two boathouses most likely related to the early religious organisation. A virtual reality (VR) headset connected the participant to the site and gives some kind of existential presence. Through VR headset we get the feeling of being there and to experience the ancient site. The research questions were: how to present this site, how to create a visualisation of this site, and what is possible?

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ABSTRACT

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 artifacts 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 is to systematically survey 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 angles of lighting helps to enhance invisible to the archaeologist. The 3D model is a multipurpose tool for damage assessment and cultural heritage management, for planning and conducting new research on the site and even the greater goal of delving into the social and economic history of southern Sicily.

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. THE RESULTS OF THE PROJECT ARE TWO-FOLD: ON THE HAND DATABASE ANSWERS QUESTIONS OF 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.

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, Gergő (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 specimens are published in a publicly accessible online database. Documentation is complemented with methodological novelties as 3D modeling and Reflectance Transformation Imaging (HRT-I) to interpret specimens which previous study has not been able to identify.

The results of the project are two-fold on one hand database answers questions of production modes, distribution, supply patterns.
On the other hand, in-depth analysis of helps clarify the phasing of sites, thus complementing our understanding of historic process.

The CLIR Research Center conducts and coordinates research on the Roman frontiers. We collaborate closely with heritage management experts (Castle Headsquartered Integrated Regional Development 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 ARK/ARDE principles with the purpose of providing a reliable research and coordination tool for experts and public and promoting the scientific community of the Danubian frontier. The database is developed in collaboration with ‘Frontiers of the Roman Empire’ WHS experts from Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania and Bulgaria and its schedule is 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): Tuulose, Catharine - Lengyl, 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 more concentration of formal visibility, 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 purely speculative additions. This methodology includes: data, photogrammetry, laser scanning and modelling, and works for sites, environments and artifacts.

The presentation aims to demonstrate and illustrate this method by several projects developed by the authors in cooperation with archaeological research institutions like:

- Cologna Cathedral and its Precursors (by order of and exhibited in Cologna Cathedral).
- Simon 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 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 Residence combining physical models, auto-stereo-scopsy and VR experience).

6 THE USE OF NEW TECHNOLOGY TO UNDERSTAND ANCIENT CONTEXTS AND EXCAVATIONS: EN EXAMPLE FROM LAZIO (ITALY)

Abstract author(s): Pasinii, Antonella (Sapienza Università di Roma; Scuola archeologica italiana di Atenee)

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 cavities of excavations for scientific purposes and in those related to Proven- tive Archaeology. 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 postexcavation study on the excavated context.

For the less recent excavations, however, the memory was entrusted to a few photographs, drawings and descriptions in the excavated context. Thanks to the aid of three-dimensional modeling, moreover, it was possible to reconstruct the volumes of the demolished structures.

THE AMPHITHEATRE OF CASIMIN (CASSINO, LATIUM): STRUCTURAL ANALYSIS AND ARCHAEOLOGICAL RECONSTRUCTION THROUGH 3D AND 3D SURVEY

Abstract author(s): Trivulzio, Ilaria (Università 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 Casimino, in south- ern Lazio. 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 WZW bomb- ing 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): Kurkovics, Abinás (Association of Lithuanian Archaeology) - Žitokas, Tadas - Laukaitas, Rimvydas (Vilnius University) - Amkevičius, Darius (Vytas 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” (no. 01.2-2-LMT-K-718-01-0043). The first results of the project are presented in this paper.

Among the novel technologies largely applied both during fieldwork and post-excavation analyses is multi-view-stereo structured light imaging (SfM-MVS). 3D photogrammetry is used to obtain high spatial precision morphological and functional data. The technique is based on the use of a large number of images of the same scene taken from different viewpoints, which are then processed with a computer algorithm to build a 3D model of the scene. The data obtained are used to create high-quality visualizations, which can be used to study the architecture and spatial relationships of the site.

However, SfM-MVS is not a panacea, and there are several limitations and challenges associated with its use. The technique is limited by the availability of high-quality images, and it can be challenging to obtain a complete coverage of large areas.

To address these limitations, the authors of this paper propose the use of convolutional neural networks (CNNs) to improve the accuracy of the 3D models generated by SfM-MVS. CNNs are a type of artificial intelligence that can be trained to recognize patterns in data, such as images. By training a CNN on a large dataset of 3D models, the authors hope to be able to improve the accuracy of the models generated by SfM-MVS.

The authors present a prototype system that uses CNNs to improve the accuracy of 3D models generated by SfM-MVS. The system is tested on a dataset of archaeological sites, and the results show that the use of CNNs can significantly improve the accuracy of the 3D models.

The authors conclude that the use of CNNs to improve the accuracy of 3D models generated by SfM-MVS is a promising approach, and they suggest that further research is needed to fully realize the potential of this technology.

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 find- ings and artifacts 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 structured light imaging (SfM-MVS). 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 ar- chaeology 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-interpreting and sharing of data. Moreover, it could bridge the gap between excavators and laboratory practitioners, enhancing the understanding of in situ artifacts and the relationships of articulated 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) - Tribolo, Andrea (University of Sheffield) - Vinet, Alice (Université Paris 1 Panthéon Sorbonne)

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

Abstract author(s): Lemorini, Cristina (Sapienza University of Rome) - Marinelli, Flavia - Venditti, Flavia (TAU Tel Aviv University) - Mutri, Giuseppina (The Cyprus Institute) - Ruta, Giancarlo (University of Ferrara) - Mussi, Margherita (Sapienza University of Rome) - Barkai, Ran (Tel Aviv University)

Abstract format: Oral

The “Expensive Tissues Hypothesis” (Aiello and Wheeler 1995) and, more recently, the “Human Predatory Pattern” (Thompson et al. 2015) 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 even 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 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 archaeology 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 archaeological 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 8 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 modes of use, according to the technological and morphological features of analyzed specimens. We found that the chopping tools were used in bone processing on hard and medium hard materials such as bone, likely for marrow extraction; the side scrapers were involved in scraping activities on medium materials while small flakes were used to mainly perform fine cutting activities on soft and soft to medium materials like animal fleshly 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, having light and dexterity 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, Giussapina (The Cyprus Institute) - Ruta, Giancarlo (University of Ferrara) - Musi, 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 artifact 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 macrofossils detected on microlithic geometric tools which are possibly related to impact fractures on geometric tools on a significant and standardized sample, could offer detailed information about hafting techniques and hunting techniques, to be used for targeted tasks during specific stages of the carcass animal processing.

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 (Vilamara et al. 2019). 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. 2015) 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 (Friedly and Foley 2015) and especially dietary and dental calcius (Martins 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 even 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.

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FUNERARY ADORNMENTS FROM THE ROMANIAN CHALCOLITHIC: OBJECTS FOR THE LIVING OR THE DEAD?

Abstract author(s): Margaret, 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 Chalcolithic necropoleis located in the southeast 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 funerary inventory. Most of the pieces from funerary contexts were made from exotic raw materials, especially from the Spondylus valve. It has been transformed into various typological categories: b/trishaped beads, tubular, fusiform and biconvex beads, various pendants, buttons, belt elements, bracelets, perforated plates. The funeral inventorys are completed by tubular beads from the scaphophus shells. Regarding the local raw materials, we can mention perforated plates made of fus sp. tooth or necklaces from Lithoglyphus netidosides 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 identify), proving that the lost/invented pieces were progressively replaced, which is a concern to keep the composite ornament intact throughout the bearers’s life.

Acknowledgments

This work was supported by a grant of the Ministry of Research and Innovation, CNCS - UEFISCUD, 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 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, opaqueness 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 chains of materials, funerary archaeology, and ethnography.

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 (Sapienza University of Rome; University of Belgrade) - Petrovic, Andja (Sapienza University of Rome; University of Belgrade)

Abstract format: Oral

The raw material of this paper is to represent how use-wear and residue analysis can help in the interpretation of sensitive archaeological questions 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 fisher, 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 also 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 Leponski 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 did individual skills manifested in a given place? Were there a connection between the recycling behaviour observed at these sites and the production of specific materials or goods? Was the specialisation only focused on the region or also outside of it?

BONE TOOLS FOR MINING ANDORE-PROCESSING (EASTERN EUROPE)

Abstract author(s): Zagrodzka, 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 (XIV-XIII BC). In order to verify the functions of archaeological bone tools we carried out experiments using similar replicates 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 leach container (a gravitational process). As a result, a new functional type was singled out - tools for mining ore in gravitational process (total 399 items). They were made from ribs, scapulae, and long bones. The functional type of scoops for taking ore made from animal scapulae 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 scapulae, found in the mines of the Late Bronze Age near Karhatov-Ovsiansko (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 Ukrainian sites.

AN INTEGRATED APPROACH TO INVESTIGATE THE FUNCTION OF A CERAMIC BASIN DIFFUSED IN THE PREDYNASTIC LOWER EGYPTIAN SITES (4TH MILL.BC)

Abstract author(s): Cariole, Isabella (Newcastle University, School of History, Classics and Archaeology) - Bajot, Jade (UMR 5608 TRACIES Université de Toulouse 2 - Jean-Jaurès Maison de la Recherche Bat 265) - Medehini, Laura (Department of Earth Sciences, Sapienza University of Rome) - Vinciguerra, Vittorio (DIBAF, University of Tuscany) - Forte, Vanessa (Laboratory of Technological and Functional Analyses of Prehistoric Artifacts - LITAPA, 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. Those oval shallow ceramic basins are characterized by a flat and wide inner surface covered by a layer of small rock fragments pressed by the daily grind. Several archaeologists interpreted them as grinding tools, but the limited number of samples unattended 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 Maa3 (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 GD-MI 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 characteristic 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.

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
PITHOI AND RESIDUE ANALYSES IN THE LATE BRONZE AGE SOUTHERN ITALY

Abstract format: Oral

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 (12th-12th century BC) a new ware, the wheel-mold pithos produced with liovitato 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, however, 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). Compared with contextual data.

FUNCTIONS OF EARLY IRON AGE HANDSTONES. EXPERIMENTAL AND TRACЕGICAL APPROACH

Abstract format: Oral

Abstract author(s): Kufel-Diakowska, Bernadeta - Baron, Justyna (University of Wrocław) - Ribeckini, Erika (University of Pisa)

Abstract format: Oral

The multi-faceted analyses proved that the community of early Iron Age settlement (7th century BC, so-called Lusatian culture) at Misejów in SW Poland used easily accessible, unworked erratic pebbles of similar shapes for various purposes. Referring to the results of 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 (grinding and decoration red pigment powdering). Erratic pebbles were selected by their shape, size, and weight. Some of the handstones of sandstone served for only one purpose, while others 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 Misejów 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 Misejów shows that beside hi-tech technologies requiring training and skills, such as glass or copper production, in a considerable part of ordinary activities people needed expedient tools made from easily accessible material, that did not require any preparation and could be simply abandoned.

UNDERSTANDING DEPOSITION PRACTICES AT TEPICEK ÇİFTLİK (TURKEY) THROUGH USE-WEAR ANALYSIS

Abstract format: Oral

Abstract author(s): Vrat, Alice (Université Paris 1 Panthéon Sorbonne)

Abstract format: Oral

Tepcek Çiftlik is located in Cappadocia (Turkey), a few kilometers away from obsidian sources. The mound was inhabited from the Late PPNI 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 Tepcek throughout the entire sequence. They are all different, they contain a great va-raity 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 large 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 slabs 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 some 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 Tepcek Çiftlik. Moreover, it raises questions about social organization and ritual practices.

USING INTERDISCIPLINARY APPROACHES TO UNDERSTAND THE FUNCTIONALITY OF EARLY BRONZE AGE STONE BATTLE-AXES AND AXE-HAMMERS; REMOVING LACUNAS IN RESEARCH

Abstract format: Oral

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 virtual 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 lacunae in research and breakdown the dated interpretations which significantly limit the accuracy of our research.

RESEARCHING THE "DAGGER IDEA" IN PREHISTORIC EUROPE: NEW PERSPECTIVES FROM EXPERIMENTAL ARCHAEOLOGY AND USE-WEAR ANALYSIS

Abstract format: Oral

Abstract author(s): Carciola, 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 placement 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.

BRONZE AGE SWORDS FROM BOHEMIA. EXPERIMENTAL USE AND FORMATION OF TRUCE TRACES

Abstract format: Oral

Abstract author(s): Havíková, Markéta (Masaryk University) - Jablůk, 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 find 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 farming structures in prehistoric Europe. The way and form of combat is, therefore, an important aspect of recognition of this social practice. The use-wear analysis methods are becoming an independent/separate field of study in Czech archaeology and are more frequent in studies on studying bronze artefacts. The aim of this paper 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.
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 Tracology - Vavilov Institute of Experimental Archeology and Ethnography); Tachkova, Maryia (Institute of History of the National Academy of Sciences of Belarus, Department of archaeology of Prehistoric Society) - Bach, Detlef (Leibniz-Institute for the Archaeological Sciences, University of Göttingen) - Vashanau, Aliaksandr (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 Melnichne (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-morpho-analytical study. 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 “heal” 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 deliberately utilised 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.

COMPOSITE BONE PROJECTILE POINT FROM BYTNIK (SW POLAND)

Abstract author(s): Skrzyp, Susanne - Eckmann, Christian - Lehnaert, Ruediger (Roemisch-Germanisches Zentralmuseum Mainz, Leibniz-Institute for the Archaeological Sciences, Schwab, Roland (Curt Engelhorn Zentrum Archäometrie Mannheim) - Bach, Detlef (Dettelbach Restaurierung Archäologischer Bodeneinrichtungen) - Thaler, Ulrich (Roemisch-Germanisches Zentralmuseum Mainz, Leibniz-Institute for the Archaeological Sciences)

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 present-day 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 techniques 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.

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 - IPNA/IPAS, University of Basel); Pats, Georgina (Integrative Prehistory and Archaeological Science - IPNA/IPAS, University of Basel; Group d’Investigacion Prehistorico, Departament d’Historia, Universitat de Lleida); - Tereso, Julio (BirdD - Network in Biodiversity and Evolutionary Biology; CIBRO - Research Center in Biodiversity and Genetic Resources/University of Porto; Centre for Archaeology, UNIARQ; School of Arts and Humanities. University of Lisbon; MNI - UP - National History and Science Museum of the University of Porto)

Abstract format: Oral

Several studies hypothesize patterns on crop dispersal routes but not on the process of crop exchange. Instead of focussing on the core crop dispersal routes, this session addresses the following themes:

- Exchange networks of agricultural tools and cooking objects.
- Can storage and storage facilities be related to exchange routes?
- How did the exchange of plants and agrarian practices contribute to the formation of Neolithic societies?
- Did exchange networks of plants and agrarian practices shape the formation of Neolithic societies?

This session invites those presentations and posters focused on archaeological contexts from the Neolithic to the Iron Age which 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.

The main aim is to identify social and economic interactions and their cultural consequences 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.

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- Exchange networks of agricultural tools and cooking objects.
- Can storage and storage facilities be related to exchange routes?
- How did the exchange of plants and agrarian practices contribute to the formation of Neolithic societies?
- What type of archaeological data is particularly suitable for new exchange models when analysing food processing practices in the prehistoric?
- Theoretical models which enable new ways of thinking about food processing in the European Prehistory.

Included usewear and residue analysis (FT-IR, GC/MS, HPLC-EI-TOF) supported with experimental tests provided evidence for the reconstruction of the process of manufacture and utilization of the composite bone tool.
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 sixteenth 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 Villanera, contemporary of the aforementioned settlements, will be analysed 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.

A SENSE OF BELONGING: CROPS, STORAGE FACILITIES AND CULTURAL RELATIONS IN NE PORTUGAL IN THE IRON AGE

Abstract author(s): Teresa, João (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 wheats (Triticum aestivum/durum), barley (Hordeum vulgare) and millets (mostly Panicum miliaceum). Pulses are scarce and almost exclusively fababeans (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 wheats clearly predominate. Furthermore, several elevated granaries were found in Late Iron Age sites such as Quinta de Cossabolas and Casteloire. 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 Mediterranean area that are going to produce and export basically cereals.

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Abstracts

1. **EM-LIKE SOFT SEGMENTATION FOR ROMAN SETTLEMENTS DETECTION IN SWITZERLAND**

   **Abstract author(s):** Castiello, Maria Elena (University of Bern) - Ceri, Raphael (University of Lausanne)

   **Abstract format:** Oral

   Spatial detection of object is a central issue in many disciplines as well as a major challenge in Archaeology. 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 homogeneous regions (nodes), according to their features dissimilarities (weighted edges) and their spatial relation. Nowadays few formal researches in archaeology 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 ascertainable archaeological evidences in Switzerland characterized by their spatial location and essential descriptive information. We used those 'objects' to characterize 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 a.g. a regional clustering. The visual output is a flatability 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 University)

   **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.


   **Abstract author(s):** Martinez-Grau, Héctor - Plata, Georgina - Jesus, Ana - Antillon, Ferran (IPPA - 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, archaeological and environmental ones. On the one hand, we have compiled the cartographical information, from dated and cultural defined levels, of the sites from the current NE Iberian Peninsula, SE France, N Italy and Switzerland (ca. 5600-2800 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 qualitative and quantitative 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.

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   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 towards 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.
TRACING A BRONZE AGE FARMLAND. THE CASE STUDY OF ŠKOFJA LOKA - TRATA, SLOVENIA

Abstract authors: Brezigrar, Barbara (Augusta d.o.o.) - Grahek, Lucija (Institute of Archaeology, ZRC SAZU) - Grčman, Helena - Turnški, 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 data about culture, chronology and settlement structures on one side and almost no information about the economy and environmental conditions of these settlements on the other side. To tackle the lack of zoological remains and palaeobotanical residues, the excavation at newly discovered site in Tura (Škofja Loka) was centered on obtaining the environmental data with palaeozoological 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, without fertilisation they have very low fertility, which is evident also nowadays. But in the second profile, on the north-west of the Bronze Age settlement, a buried dark earth layer was found with increased amount of organic matter and much phosphorus (460 mg P2O5 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.

ARCHaeOwłOTICAL MATERiALS FROM ANCiENT ARABLE LAND: SOURCES AND DISTRIBUTiON PATTERNS (ACCORDING TO COMPREHENSIVE STUDIES OF RESOURCE ZONES OF SETTLEMENTS)

Abstract authors: Babkena, 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 archeobotanical 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 microcharcoals. 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 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).

HUMAN IMPACT ON LANDSCAPE IN SMOLENSK REGION (WESTERN RUSSIA): A MULTIPROXY STUDY

Abstract authors: 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 wave 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 Smolodo-vo). 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 peasant land near Gusinskoe village (the second site) was supposedly appeared due to an anthropogenic process with slash-and-burn agriculture. Slash-and-burn markers are also present 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 19-39-90172.
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 Transylvania’s Minero-Metalliferous area is marked by the appearance of new communities from the Sahara and the rapid abandonment of many Middle Bronze Age cultural identities and practices. A new Bayesian radionuclide chronology, however, suggests that Transylvania’s Minero-Metalliferous area was colonized a different trajectory. The Wietenberg Culture, Transylvania’s Minero-Metalliferous area cultural identity, persisted into the Late Bronze Age for over 150 years in Transylvania, 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 many traditions of the region remained stable. The most active use period of the cemetery falls between 1600 and 1500 calBC, and a critical period where the orthodoxy 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. At low resolution, our analysis suggests that the Celtec community held funerary rites that were similar to those of neighboring communities. While we study only have relevant implications for ceramic-based regional chronologies, but also offers a cultural practice-based measures potentially useful for interpreting the tempo and regional character of the Middle to Late Bronze Age transition elsewhere.
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 – Verbeia (10th-9th c. BC), Petrova (9th-8th c. BC), and Naide, well known in the Lower Danube Basin. In this region, cremation has EBA precursors, and is carried on through the Verbeia Group of 15th-16th c. BC period. The next stage, according to certain dating systems, belongs to the First 14th to the 12th c. BC. The last stage corresponds approximately to the 1200 – 1000 BC. The AM2 radio carbon dates from the region began only recently. From the beginning there are 13 AM2 radiocarbon dates from animal bones, from the last two stages of the necropolis: 10th-13th, and 14th-11th c. BC.

In these graves there are more than 90 exact 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 necropols belonged, the common traits and the transformations – in the pottery as well as in the animal, 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 Iraga) - Bruyere, Caroline (University College Dublin) - Bircus, Mircea (National Museum at Pancevo) - Estesquino, Marts (University College Dublin) - Milusinovic, 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 micropalaeo studies. The excavation of several enclosed sites, coined mega-forts, in the last decade has begun to provide hitherto absent information on aspects of social organization elsewhere. However, limited progress has been made on understanding the ties that link these individual sites in their landscape and sociocultural context.

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 BC, after the abandonment of tells, and continued to be occupied into the 13th century BC. The chronology and character of this post-tell occupation remains unclear. With more than 10 known sites, the rise of the mega-forts is associated with the development of smaller but related settlement forms and the spread of channel-decorated pottery throughout the region. Even though the period 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 the spread 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 set between specific settlements and represent a collective regional social organization that exercised control at a landscape rather than settlement level.

10 SÁNTANA-CETATEA VECHE AND THE COLLAPSE OF THE LATE BRONZE AGE SOCIETY IN THE LOWER MURES BASIN

Abstract author(s): Sava, Victor (Museum of Arad) - Gogățian, 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 Mures Basin. The number of settlements increased significantly at that time, just like that of the bronze and gold hoards. The common conditions of the area reached distant regions, as attested by the diversity of raw materials in the objects 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 creations and complexity of the system of fortification and their good state of preservation. At the same time, isometric measurements have led to the identification of 29 buildings, of which some have already been covered by recent archaeological excavations. Among these constructions one notes a building measuring ca. 1700 m2. The excavation of the fortification system 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/led pottery decorated with channels, known as Gáva pottery.

11 FROM TELLS TO FORTIFIED MEGASITES: THE MBA-LBA TRANSITION ALONG THE LOWER MAROS AND THE BERETTÖ Y 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) - Prókian, Anna (Déri Múzeum, Debrecen; Universitat Autonoma de Barcelona) - Caucker, Piotr (Maria Ferenc Múzeum, Szeged)

Abstract format: Oral

The transition from the Middle to the Late Bronze Age in the eastern part of the Great Panonian 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 Berettyő 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 Berettyő 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. 900 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. THEMES AND METHODS OF BARROWS INVESTIGATION IN MODERN ARCHAEOLOGY

Themes: 5. Theories and methods in archaeology: interactions between disciplines

Organisers: Stabała, Michał (Cardinal Stefan Wyszynski University in Warsaw, Institute of Archaeology) - Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT - Rodriguez-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, UDARP has raised the detection of historic and prehistoric 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 in 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; isochoric 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 investigations.

1 MEGALITHIC QUARRIES AND LOADING MODELS IN THE MEGALITHS OF SALAS COUNCIL (NW IBERIA): A COMPUTATIONAL APPROACH

Abstract author(s): Rodriguez del Cueto, Fernando (Universidad de Oviedo, Facultad de Filosofia y Letras, Departamento de Historia) - Pozos, Miguel (GEPN-AAT, University of Santiago de Compostela)

Abstract format: Oral

Traditionally, the Northwest of the Iberian Peninsula has been considered 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 Sales (Asturias), and thanks to the ongoing Digisemba 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 Cobertoria. In this framework, the study of the relation between mounds 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. Threw of it, 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 positive 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.

BARROWS AND MOUNDS AS A INTANGIBLE CULTURAL HERITAGE – SOME REMARKS FROM BIAŁOWIEZA FOREST REGION

Abstract author(s): Wawrzenuk, Joanna (Institute of Archaeology, Cardinal Stefan Wyszynski University in Warsaw)

Abstract format: Oral

The construction of mounds is usually the result of a conscious human action that requires some idea, proper thought and arrangement. In the cultural landscapes, 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 toponyms provide some explanation. Some information are provided in the ethnographic data 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 meditation, a symbolic obstacle separating the deceased and the living, a manifesto of power or a kenotaph. It could be used for different funereal rites. The understanding of barrows or mounds will be presented on the example of object from the Białowieża Forest region from different periods.

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 Wyszynski University in Warsaw)

Abstract format: Oral

The Bielska Plain is major region, located in north-east Poland, is it 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 3D models in order to understand environment and geospatial regularity for mound features. All of several spatial analysis were conducted for cluser. 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.

A STUDY OF BURIAL MOUNDS IN RUSSIA USING LI DAR BASED ON DRONE-MOUNTED LASER SCANNER FOR DATA ACQUISITION AND VERIFICATION

Abstract author(s): Novikov, Vasily (Institute of Ethnology and Anthropology - IEA, Energetransproekt) - Kainov, Sergey (State Historical Museum) - Vladimirov, Alexey (Kuban State Technological University) - Dorodnix, Svetlana (Energotransproekt) - Vlasov, Dmitry (Energetransproekt, MSU)

Abstract format: Oral

A massive LiDAR survey, covering an area of 1442.1E 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 413,86 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 of Russia (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 affected 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 scanner technology 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.

SPATIAL STRUCTURE OF THE MEDIEVAL BURIAL SITE WITH DESTROYED BARROWS: INVESTIGATIONS IN SHEKSHOVO, NORTH-EASTERN RUSS

Abstract author(s): Krasnikova, Anna (State Historical Museum) - Makarov, Nikolay - Erokhin, Sergey - Ugulava, Nani - Milovanov, Sergey (Institute of Archaeology, Russian Academy of Sciences) - Tsirklo, Ksenia (Institute of Geography, Russian Academy of Sciences) - Zaytseva, krina (Institute of Archaeology, Russian Academy of Sciences) - Modin, Igor - Pulevin, 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. Excavation of the site in 2011-2015 at the area of more than 2800 sq m, revealed the remains of 16 levelled barrows with both destroyed and intact inhumations and cremations, remains of grave 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, khams, 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 rites 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 N19-18-00398.

CORRELATION BETWEEN LOCAL GROUPS OF BURIAL MOUNDS IN BESSARABIA

Abstract author(s): Topal, Dorin (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 interfluve, while there are 6,290 burial mounds in the right-bank region of Moldova. On average, 2.5 mounds per 100 km2 are located between the Dniester and the Prut rivers. Preliminary data on the mounds distribution 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 standout the Moldo-Prut, the Dniester-Black and 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 barrows of various cultural and chronological masses.

CHANGE OF SPATIAL DISTRIBUTION PATTERNS OF AMASA-DONG SITE BASED ON THE TOPOGRAPHIC CHANGES OF THE NEOLITHIC AND THREE KINGDOMS PERIOD

Abstract author(s): Yu, Sun Woong (Hanyang University Museum)

Abstract format: Oral

This study was focused on the fact that the patterns of spatial distribution of the Neolithic and the Three Kingdoms period in Amasa-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 toposgraphic changes and archaeological aspects can help to understand the past as well as Amasa-dong site. For example, the study of the Neolithic Period on the Korean Peninsula tends to examine several sites together. It 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 concisely through the quantitative and empirical review that goes beyond the threadbare and abstract common sense research that the idea of sampling was affected by the natural environment.

a. FROM ONE-TO-MANY: DECODING SPATIAL DISTRIBUTION OF BURIAL MOUNDS IN NE ROMANIA

Abstract authors: Bresovan, Casandra & Radulescu, Andrei (Interdisciplinary Research Institute - Science Department, Arheoinvest Research Centre, ‘Alexandru Ioan Cuza’ University of Iasi) - Pintâu, Rodu (Romanian Academy, Iasi Branch, Geography Group) - Brunchi, Radu (University ‘Alexandru Ioan Cuza’ of Iasi)

Abstract format: Poster

The north-eastern part of Romania contains a huge number of burial mounds most of them unexplored and less understood. Previously, 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 Bahluieμ 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 repositories 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 geo-physical 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: G. Theories and methods in archaeology: interactions between disciplines

Organisers: Demján, Peter (Institute of Archaeology of the CAS, Prague) - Gáladiaksa, Bissinka (Independent Researcher) - Dreslerova, Dagmar - Vondrovsky, Vladimír (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.

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) - Filippović, Dragana - Kreisa, Wiebke (Institute for Pre- and Protohistory, 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 14C 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 DRC 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 (Filippović 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.


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 us 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 probability is associated to either the input constraints or the output ranges: the latter are guaranteed to be optimally consistent with the former. We present a proof-of-concept demo that provided the input constraints are correct. We will show how to expand our approach with regard to radiocarbon dating and compare it to the more classical Bayesian approach to chronological modelling.

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 data with a specific event (such as falling of a tree) which lie to the context 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 its 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 neg-
ural 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. C2.02.1.010.00.016, 019/0000726).

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 astronomical 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 modeling 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 data - implications 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. C2.02.1.010.00.016, 019/0000726).

5 SPATIOTEMPORAL INTERPOLATION BASED ON BULK RADIOCARBON DATA: TWO CASE STUDIES FROM ARCHAEOLOGY AND ARCHAEOGENETICS

Abstract author(s): Schmidt, 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 EUROGEOV[1].AustArch[2] or KTEEastAfrica[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 sites 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: Flot graves versus burial mounds and cremation versus inhumation. The radiocarbon database RADON II[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 archaeological 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 data. 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): Dárdóczi, 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 creating a comprehensive spatio-temporal distribution and explore patterns of large-scale change.

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7 CENTRAL EUROPEAN EARLY BRONZE AGE CHRONOLOGY REVISITED: A BAYESIAN EXAMINATION OF LATE LBK RADIOCARBON DATING

Abstract author(s): Brunn, Mirco (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCRD; 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 - OCRD) - Szidat, Steena (University of Bern, Department of Chemistry and Biochemistry; Oeschger Centre for Climate Change Research - OCRD) - Hofner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; Oeschger Centre for Climate Change Research - OCRD)

Abstract format: Oral

In archaeological research methods in material culture and the evolution of styles are taken as main indicators for socio-cultural transformation. This typology was based on the basis for typology 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 in 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 3(N) 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 stages of transitional progress. Here, we adapt 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 Bz B1 and Bz B2 and disclose 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.

MEDEIVAL 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 townscapes and the topography from the perspective of ecclesiastical buildings, cemeteries or other areas reserved for religious rituals 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 the methodological problems, relations between different ecclesiastical buildings, ecclesiastical building evolution and adaptation, the topography of cemeteries and their transformation inside a town, medieval townscapes, spatial analysis, etc.

EXPLORING THE SACRED SPACES OF MEDIEVAL SIBIU: CHURCHES, MONASTERIES, CHAPELS AND CEMETERIES

Abstract author(s): Cringaci Tiplic, Maria Emilia - Nocu, 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 1319 as an ecclesiastical center of the Transylvanian Saxons and was home to numerous places of worship, monasteries, and churches, which played a significant role in the spiritual and cultural life of the region. The paper will explore the relationship between the sacred spaces and the townscapes of medieval Sibiu, focusing on the organization of the urban fabric around the main religious sites, such as the cathedral, churches, and monasteries. The analysis will highlight the role of these spaces in the political, religious, and social dynamics of the region, and their contribution to the identity and cultural landscape of medieval Sibiu.
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 industrialisation and the communist dictatorship (the 19th and 20th centuries), the medieval places of worship and devotion and their neighbours have been deeply transformed. Consequently, the previous scientific contributions regarding the identification of the first parish church and of some 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 townscapes 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, Patriomini Foundation, research project number GAR-UM-2019-9-2-6-3 / 15.10.2019.

2 THE CHURCH TOPOGRAPHY OF EARLY COPENHAGEN
Abstract author(s): Jerk Jensen, Jane (Museum of Copenhagen)
Abstract format: Oral
In Copenhagen two medieval churches, both founded in the 11th century, existed by side side only 350 meters apart in the early
town of Copenhagen. One of them was taken out of use after about 100 years and vanished from the townscapes, whereas the other
churchyard, St Clemens, existed until the Reformation in 1536. The two churchyards were both partly excavated between 2008
and 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 burial 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 study also tries to show how the churchyards would have presented themselves to the surrounding urban community, and what
the signs are of the 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 BRASOV IN THE MIDDLE AGES
Abstract author(s): Nacu, Andrei - Ciołtărieu, 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 abbey are a structural element of
the medieval European townscapes. This is also the case of Brasov, 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 ecclesiastical to-
poigraphy of medieval Brasov 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
diagrams 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 reconstitution that will constitute a support tool for
the scientific community and an incentive for the preservation and promotion of the medieval cultural heritage of Brasov.
This work is supported by a grant of Romanian Academy, Patriomini Foundation, research project number GAR-UM-2019-9-2-5-9 / 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 (ROMUL Roskilde Museum)
Abstract format: Oral
In 2019 the remains of a late medieval brick-build house and cella 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 Margaret 1, ruler of Denmark (1176-1412). 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 urban residential patterns, in opposition to the mercantile, economic and infrastructural factors

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 ocrasy in the Baltic countries discovered, containing skeletal remains of almost 4000 in-
dividuals. 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, belon-
ging mainly to local German population near the Dome Church and St. Peter’s Church were investigated and published previously.
New source material available now allows researchers not only localise more precisely the unknown border 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): Sinter, 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 12th
century), there was a stronghold surrounded by numerous settlements. In the 13th century, a Benedictine abbey was founded. In
the 12th century after the abbey was demolished, the Romanesque arch-cathedral church was erected and which exists up to 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 medieval ages Dominican monastery was several times burnt and rebuil, finally having absorbed both the gothic defensive
walls and the career tower. In 1799, when Poland was under the Russian occupation, the convent was dissolved and Russians 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 ECClesiASTICAL MONUMENTS OF BRASOV/KRONSTADT/BRASSÓ AND THE IMAGINED TOPOGRAPHY OF A TRANSYLVANIAN TOWN IN LATE MEDIEVAL AND EARLY MODERN TIMES
Abstract author(s): Cimpanu, 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 Transylvania,
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, „Patriomini” Foundation, research project number GAR-UM-2019-

8 NECROPOLIS OF MID 12-19C. IN THE STRUCTURE OF GOROCHOVETS’ TOWN AREA
Abstract author(s): Mitrovian, Sergal (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
princedom. In the early period of the Gorochovtsi’s 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 necropolis on the edge of the high bank signifies that the critical location of the mound 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).

In 1259 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.

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 Cândamus 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.

b. THE TOPOGRAPHY OF MENDICANT ORDERS IN MEDIEVAL TRANSYLVANIAN TOWNS
Abstract author(s): Cioltei-Hopartean, Corina (Institute of Social Sciences and Humanities Sibiu)
Abstract format: Poster
The 13th century has favored the emergence and rise of mendicant orders deep within medieval European society. This was the century of religious reformationary 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 favours 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.

The present paper aims to reveal the changes brought upon the topography of medieval towns by the mendicant cloisters as depicted through written and archaeological sources. Through a comparative analysis of the medial 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 Brașov, Sibiu, Brașov 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 mendicant topography, others are portrayed rather by contrast, this being the case of Sibiu, one of Transylvania’s most representative urban areas.

This work is supported by a grant of Romanian Academy, ‘Patrimonii’ Foundation.

245 ESTABLISHING BOUNDARIES: LINEAR EARTHWORKS, FRONTIERS AND BORDERLANDS IN EARLY MEDIEVAL EUROPE
Theme: 2. From Limes to regions: the archaeology of borders, connections and roads
Organisers: Delaney, Liam (University of Chester) - Tummschacht, Astrid (Archäologisches Landesamt Schleswig-Holstein) - Williams, Howard (University of Chester) - Witte, Frauke (Museum Sönderjylland)
Format: Regular session
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.

Not 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.

This ERC sponsored session aims to promote new research on early medieval frontier landscapes, including monumental linear, their landscape settings, affiliations andlegacies, including their heritage management and interpretation. The session organisers invite contributions addressing themes relating to linear earthworks and medieval frontiers and borderlands including: (i) their role in 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; (vii) their contemporary role in modern cultural identity; (viii) the impact of heritage conservation, management and interpretation on these features; (iv) how they are viewed in contemporary media and popular culture.

1 DYKES AS DEEDS – MEMORY AND MONUMENT-BUILDING IN EARLY MEDIEVAL EUROPE
Abstract author(s): Williams, Howard (University of Chester)
Abstract format: Oral
Can we consider dykes as ‘deeds’? Manmable and efficacious for their creation and placement more than their longevity of use? This paper presents a new framework for interpreting the mnemonicsof 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 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.

2 LINEAR EARTHWORKS IN SCANDINAVIA: AN OVERVIEW
Abstract author(s): Witte, Frauke (Museum of Southern Jutland)
Abstract format: Oral
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. More 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 un researched and only a few have been archeologically investigated, therefore details of their building history and precise dating are often unknown. The majority are only recognized because they can still be seen by eye or through aerial photography. A few were discovered by coincidence under excavations.

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 (Hærener). 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.

This paper will show the distribution and type of the Scandinavian barriers and try to discuss who their builders might have been.

3 MAKING A MEDIEVAL BORDERLINE: THE ARCHAEOLOGY OF TRADITIONAL MEETING PLACES ON THE ANGLO-SCOTTISH BORDER C. 1200-1500
Abstract author(s): Steingraber, Aubrey (University of York)
Abstract format: Oral
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?

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 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 confirmed. This presentation highlights a few case studies from a larger project examining 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.
4 THE DANENVIRKE – A LINEAR BARRIER, BORDER AND PIECE OF REPRESENTATION

Abstract author(s): Vitta, Frauke (Museum Sønderjylland) - Tummscheit, Astrid (Archäologisches Landesamt Schleswig Holstein)

Abstract format: Oral

The Danenvirke 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 Danenvirke 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 - Arkæologisk Haft in Denmark carried out transnational excavations at the monument. These have led to important new findings, which include a) the discovery of the site of a gateway, where major transport routes converged for at least 500 years. Furthermore, 1140 dates indicate that the origins of the Danenvirke date to before AD 500, making it more than 2000 years older than previously thought. During the Early Middle Ages, the Danenvirke 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 12th century, a monumental brick wall was erected by the Danish king Valdemar the Great. The ruins in the 12th century Danish-Prussian war of 1864 and in World War II included, the Danenvirke was in use for at least 3500 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 the results and current working hypotheses mainly concerning the Danenvirke’s chronology, which will enable us to relate the sites history to specific historical situations and developments, such as 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): van Kervorst, Søtekin (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 maerlakes 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 unbanked tidal marshland, with small settlements concentrated along the river mouths. 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 to 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, retrospective analysis, archaeological excavation with artefact-based dating or carbon 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 presumptively 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): Dalyan, Liam (University of Chester)

Abstract format: Oral

The ancient 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 and 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): Bedford, Paul (Clwyd-Powys Archaeological Trust)

Abstract format: Oral

Offa’s Dyke is the UK’s longest linear earthwork, stretching for over 220km through the borderland between England and Wales. Recent excavations of 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 1650s 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 define 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 this 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: RETRODUCING COMPLEXITY INTO TWENTY-FIRST CENTURY ENGLISH ORIGIN NARRATIVES

Abstract author(s): Roddy Mackey, Malianie (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 scholar- ship 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. Those 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-Cold-World Britain. But what about the people who constructed 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-temporal generations at least, borders change, but it’s our enduring curiosity about each other that prevails.

252 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, Jenen (Cultural Heritage Agency of the Netherlands) - Patrick, Laura - Berryman, Duncan (Queen’s University Belfast) - Huggan, 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 trading routes. 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 trading 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 spread? How was building material obtained and how did building ideas spread? 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.

1 WHERE DID THE BUILDINGS COME FROM? SOURCES OF BUILDING MATERIALS IN LATER MEDIEVAL ENGLAND
Abstract author(s): Berryman, Duncan (Queen’s University Belfast)
Gardelin, Gunilla (Kulturen) – Oral
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 farther afield. This paper will discuss sources of building mate-
rials in medieval England. This work will utilize 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 signifi-
cantly 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 employed by Henry VIII fol-
lowing Wolsey’s fall from power. The scale of the construction effort, under Henry VIII alone almost 26 million bricks were purchased between 1529 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 this palace. The documen-
tary 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 VII 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 were identifiable in the building accounts and the influence of international style is evident in the surviving architecture and architectural

3 CHURCH ROOFS IN A FRONTIER REGION – HISTORIC TIMBER STRUCTURES IN WESTERN SWEDEN REFLECTS CHANGING INFLUENCES AND RESOURCES
Abstract author(s): Gulbrandsson, 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 (Kvarners Kulturbygg 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, 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 reflect craft traditions, resources and so-
ciety. Different traditions indicates influences from Norway, Denmark and Germany. The majority of the examined roofs are dendro-
chronologically 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 large 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 preserved german roofs of the time. The later 16th century saw the effects of reformation and new swedish-danish wars with heavy navages on churches, still visible in the buildings. The wood of the roofs and its proveniences gives an understanding of changes in the landscape and the availability or lack of good construction wood. From having been easier to use for oak wood – partly for the danish crown – all three landscapes were more or less out barynn the 17th century, leading ultimately to the need of import from the northern landscapes of Sweden.

4 STONEMASSON’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. The wood was preferred material, as seen in stave churches and timber core
lofts, and only around 950 stone structures survive from Norway AD 1100-1500. Primarily, the church in addition to the King, con-
trolled 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 indi-
cates 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 stone-
mason 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
nancing 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): Tavass, Morten (Museum of Southwest Jutland)
Abstract format: Oral
Stone architecture using limestone was introduced in Denmark during the reign of Cnut the Great (1013-1014-1035) most likely by masons coming from England. Before 1900 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 cat-
chedral buildings sites in Lund, Ribe and Skelhov. At Viborg cathedral local moraine blocks of granite were transformed into beautiful
ashlars 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 work-
shops, seem to have been the key players.

6 INFLUENCERS IN DANISH BRICK ARCHITECTURE
Abstract author(s): Guldbrandsen, Robin (Västergötlands museum; Department of Conservation, University of Gothenburg)
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

...
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 16th and 17th 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 architectural changes are connected to changes in politics, religion and the alteration of trading partners in the Baltic Sea. 

AN EXCEPTIONAL 12TH CENTURY TILED 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 1991. The church had several building phases: originally built as a wooden church in the 11th century; the church was rebuilt as a Romanesque stone (tavertine) 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 16th century 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 Roskilde 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.

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 stone buildings and the available evidence for these Orders in the Holy Land 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 importance, 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 European sites, and how did these interplay with wider religious, social, and economic influences at play in the Kingdom of England during the medieval period?

CARRICKFERGUS CASTLE 1178-1242. CULTURAL INFLUENCES AND NEW IDEAS IN THE MAKING OF AN ANGLO-NORMAN FORTRESS IN ULADH

Abstract author(s): Botturi, Chiara - O’Keefe, John - MacRandal, Derron (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 work (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, the rationale and influences behind various 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 more imposing four-storey tower (with sunken roof and headings), subsequently enhanced by the creation of a great chamber at top floor, spanning 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 12th 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 Largur’s rock.

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 Ulaidh, and owes its foundation to the Anglo-Norman knight Hugh de Courcy. As recently as 1178/9. Despite the fact that the town is situated on the periphery of the Anglo-Norman 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 19th 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?

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. What has been a focus of discussion is the evidence that the Orders in the Holy Land 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 importance, 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 European sites, and how did these interplay with wider religious, social, and economic influences at play in the Kingdom of England during the medieval period?

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.

BUILDING NETWORKS! CIRCULATION OF WORKFORCES, TECHNIQUES, ARCHITECTURAL MODELS: ROMA AND THE LAZIO REGION IN THE ITALIAN AND EUROPEAN CONTEXT

Abstract author(s): Gianni, 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 “Petrying Wealth. The Southern European Shift to Masonry as Collective Investment in Identity, c.1050-1400” is a European Research Council Advanced Grant (GA 07 69 565/5). By analysing building types and techniques in a long time period (5-15 centuries), the research allowed to identify the exchange of aesthetic ideas, technological know-how, and mostly of building materials with the cistercian and the romanian worship. The present contribution aims to define, through the same elements, architectural knowledge and 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.
Rudolf II. Regarded as proficient and skilled builders, Italians made a major contribution to the building activities throughout the city. The unused land immediately north of the newly established Habsburg Empire.

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. These investigations can reveal various forms of social display realized at a residence type which might be considered as a response to a specific function, and then I will analyse any regional and temporal variation amongst the dataset. This process highlights the networks of architectural motifs wandering through royal courts, baronial castles and noble dwellings in the late medieval ages, with a focus on the 16th century, when the Prague Castle complex had its peak of development in the Baroque style.

The present paper aims therefore at suggesting a new way of looking at building activities in Rome during the Middle Ages, certainly driven by the collapse of the Roman taxation system and the establishment of self-sufficient, isolated communities. Cattle decrease in size since the 4th century. At the same time, it 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 leading to 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.

In this study, the biometric 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 the numerous 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 yields; 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 leading to smaller scale, self-sufficient subsistence economies. In this study, the biometric evidence from domestic animal remains is used to provide insights on the economy of Late Roman and early post-Roman Britain.

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of substantial buildings with walkways and rich, well-preserved middens. This study is part of the multi-disciplinary exploration of the fifth to 12th century midden deposits. The preservation of remains in these deposits is exceptional for western Britain and the results underline the predominant consumption of terrestrial resources and imported food products rather than reliance on marine resources. The zooarchaeological, archaeobotanical and anthropological analyses are integrated with the archaeological data (dating, settlement, deposition/history). The paper will explore the organisation for food provisioning and resource use within the settlement and its hinterland from the late Roman through to the Early Medieval period. This 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):** Randal, Clare (Praehistoric 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 the Empire, 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 5th-6th century AD material from the re-occupied 20th 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 mills, used both for hard 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 analysis (including isotope) analyses of the mill stones, and historical research. The large-scale milling carried out at the site suggests 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-rivier 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 villas groups taking part in this. Following recent publications like Loveluck (Northwest Europe in the Early Middle Ages, 2013) we think 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 came with them concerning the "vibrant" nature of the rural peasant economy during the 8th and 9th centuries in the Low Countries.

### 5 FROM VILLAGES TO EARLY MEDIEVAL COMMUNITIES: CHANGES AND CONTINUITIES IN HERDING PRACTICES

**Abstract author(s):** Gallego Valle, Abel - Colominas Barberà, Lídia - 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 representation 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 anthropological 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) - Ramal-lo Auesio, 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 Cartagena (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 production and economy products and their draft force were used. Livestock management 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 harding 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):** Cianciosi, Alessandra - Gelichi, Sauro - Garavello, Silvia - Fort, 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 ‘Equo’ or ‘Equilis’ its geographic position, between the 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 well preserved and has been investigated between 2013-2016 by Ca’ Foscari University of Venice.

The settlement of Equo developed during the 4th-5th centuries, when a ‘manus’ was founded, it was used as a resting and exchange station for officials, soldiers and postal services that travelled from Attila to Aquila using waterways along the ‘usage publicus’. The community that was settled at the Equo’s ‘manus’ 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 Equeo. 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 bioarchaeological 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):** Lo Asensio, Sebastián (University of Murcia)

**Abstract format:** Oral

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 bioarchaeological and zooarchaeological remains.

**Abstract format:** Oral

The changes in the Roman economy of Sicily 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 of the Roman Empire from Rome to Constantinople also led to the transfer of the provinces of Africa Proconsularis 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 classes and the transfer of villas’ management turned to the Church or other owners caused variations in the economic activity of Villas. These processes are economically 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 focussed on cattle and sheep and indicates networks of supply from the countryside to the town. By contrast, agricultural production in the early dating and the location of the site as a nodding point in the Dijle system (a part of the outstretched Scheld-rivier 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 villa groups taking part in this. Following recent publications like Loveluck (Northwest Europe in the Early Middle Ages, 2013) we think 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 came with them concerning the "vibrant" nature of the rural peasant economy during the 8th and 9th centuries in the Low Countries.
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): Marković, Dima; Mršić, S. (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 farming activities and the role of livestock in the economy changed. Although it is possible to observe that such developments impacted the livestock-manage practices, direct evidence on changes in livestock 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 interpreting the scarce archaeological 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 distinct (but so far not 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 (8th/10th century AD; published by L. Bartosiwicz 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 the analysis of faunal data from sites located in the hinterland of the Central Balkans. This will allow us to trace 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): Salari, Konstantina (Natural History Museum of Vienna); Tobias, Bandeug (Austrian Academy of Sciences); Dragnits, Erich (University of Vienna)

Abstract format: Oral

Since 2005 systematic research excavations at Pödersdorf am See, a village directly east of Lake Neusiedl/Fertő in the westernmost 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 places. 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 archaeological 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 changes have been identified in human settlement patterns, including the presence of a Late Roman期 communal structure (cattle, sheep/goat and pig), in order to understand animal husbandry practices at the site, and to investigate possible changes derived from the societal-urbanic upheavals that the city underwent in this period of crucial transformations. This large faunal assembly was recovered in contexts dated between the 5th and the mid-10th century AD, therefore covering the Merovingian, Carolingian and Ottoman 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.

11

ANIMAL HUSBANDRY IN TIMES OF CHANGE: THE ZOOARCHAEOLOGY OF COLOGNE (GERMANY) DURING THE EARLY MIDDLE AGES

Abstract author(s): Grau-Solgégesto, Idiba (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, MISCA-F), the faunal remains recovered between 1996 and 1998 at the excavation of Neumarkt in Cologne (Germany) have been examined. Special attention has been paid to the taxonomic frequencies, the sub-fossil 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 Ottoman 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.
LIVING WITH DEATH. ARCHAEOLOGY OF DEATH AND RESILIENCE RESEARCH: BROTHERS IN ARMS?

Abstract author(s): Hofmann, Kerstin (RGK - Romano-Germanic Commission DAI) - Rebay-Salisbury, Katharina (Institute for Oriental and European Archaeology, Austrian Academy of Sciences)

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 aim is to analyze how lived experiences of death can be related to the perception of the deceased. Drawing on recent psychological and social research, this paper will explore the complex processes of coping with death and the afterlife through the lens of archaeological evidence. The presentation will focus on the specific contexts and practices of death and mourning in the Middle Ages, highlighting the role of family, community, and religious traditions. The paper will discuss how these factors interacted to shape coping strategies and resilience in the face of mortality.
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 service as consoling 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 reoccupations. As Roger lor Lohmann (2006, 190) points out in his study of Geometric 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 persons of the deceased was reconfigured, making possible its manipulation at the cross-roads of object and individual. As the geneses of this session state, in this way the living dealt with the ambivalence of presence and absence of the dead.’


7

RESILIENCE IN THE FACE OF DEATH. HOW CAN WE KNOW THEY COULD COPE WITH BEREAVENTM?

Abstract author(s): Chub, Natalia (IKS - Romano-Germanic Commission (DAI))

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 success of 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): Åbriis, Sofie Laurine (University of Bergen)

Abstract format: Oral

When rune 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 heterogenous group. Some are short, maybe only a name buried inside a mound or stone setting. Particularly, male names can be found in mounds with female burials. Other commemorations are placed in the open on rocks or stones, and many 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 at an afterlife and commemoration for those left behind.

9

FUNERARY PRACTICES AND EPIDEMIC DISEASE: A DIACHRONIC ARCHAEOLOGICAL REVIEW OF PLAQUE GRAVES

Abstract author(s): Oulaskäki-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 quicly, 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 palaeogenetic 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 deceased 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): Hegedüs, 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 deceased 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 more peripheral 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 temporal 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.

THE FUNERAL RITE AT THE LBA-EIA CEMETERIES IN THE SOUTH-EASTERN POLAND AS A SEQUENCE OF ENCODED, CULTURAL AND RITUAL ACTIVITIES

Abstract author(s): Korzyńska, Marta - Moskal-del Hoyo, Magdalena (W. Szafer Institute of Botany, Polish Academy of Science - es) - 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 unfield cemetery in Janowice, site 44 (West- ern 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 funerary 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 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 deceased 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.
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 Dortona, Penugia, Volitia, Tuscania, Cerveteri). Furthermore, this practice is most commonly often, but not exclusively, related to outstanding, individual tombs. In my paper, I’ld 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 strengthened both individual and collective resilience, for instance in the face of loss but also 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 BURROWS IN LATE MEDIEVAL – EARLY MODERN PERIOD LITHUANIA**

Abstract author(s): Kurila, Lourynas (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 against a background of the religious discord, and the frequent conversions. 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 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 Lódz, 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. I will consider how death looked from the perspective of a person looking at the deceased assembled in a specific, unique coffin.
inhabit numerous questions about continuity vs. discontinuity in those turbulent times.

THE SHIFT BETWEEN PAGAN AND CHRISTIAN FUNERAL RITUAL IN EARLY MEDIEVAL TRANSYLVANIA (9TH TO 12TH CENTURY AD)

Abstract author(s): Típlic, Ion Marian (Lucian Blaga University of Sibiu)

Abstract format: Oral

In early middle ages, the territory of present-day Transylvania was disputed by Bulgarian Tarast, Byzantine Empire and later Hungarian principalities. This poster 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 iluia, Cluj-Mănăștur, Debâlia și Moșna-Parângul, fortified settlements located on former Roman towns. All these are known for the early Medieval cemeteries some of which emphasize the emergence of the new 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 emergence within the population. This was emphasized by the “pagan” funeral rituals. The food offering inside ceramic vessels represent a common practice within those pagan believes. The food offering is documented during the centuries prior to the 10th one.

All these places were early medieval churches with adjacent cemeteries which shows the shift between pagan and christian funeral rite starting with the first half of 10th century AD.

CENTRAL PLACES IN THE EARLY MEDIEVAL CARNIOLA?

Abstract author(s): Koro, Spela (Zavod za varstvo kulturne dediščine Slovenije; Narodni muzej Slovenije)

Abstract format: Oral

The early medieval Carniola, Sclovarum patria (the homeland of the Slavs), as mentioned by Paul the Deacon in his Historia Lagobarorum 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 Annalès regni Francorum mention Carniolensis, 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 Friul under Frankish dominion at the latest around 900.

However, a political and organisationale structure of Carniola and its central places remain unclear. Historically, the main centre of the region was Carnium, the modern Krain. Its significance in the early medieval period is reflected in the size of the settlement and in the large cemeteries with burials from the 9th 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 Bleda, a hitherto a 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.

STONE FORTIFICATION AROUND THE 11TH-CENTURY SZÉKESFEHÉRVÁR: RESULTS OF AN INTERDISCIPLINARY RESEARCH

Abstract author(s): Szőcsi, Frigyes – Szőllősy, Csilla (King St. Stephen Museum) – Morgós, András (Constat) – Horváth, Emil (Independent 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 (University of Székesfehérvár, Faculty of Agricultural and Environmental Sciences, Department of Nature Conservation and Landscape Ecology) – Csókidi, 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 1.7 hectares large area, so it is not identical with the royal castle (castle of the Comas) covering 0.8-1.2 hectares on the highest point of the area.

Thanks to the excavations lead by Csilla Szőllősy, Frigyes Szőcsi and Emese Csókidi 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 embankment 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 (formed by András Morgós – Emil Horváth and András Grynaeus). Radiocarbon analyses of 5 samples were determined by the EnvironMACA14 14C facility in the Hartland Laboratory of Environmental Studies, Dobszany, Hungary. The so-called wiggle-matching technique was applied in the calibration of radiocarbon results obtained from dendrochronologically cross-dated tree-ring sequences (formed by Zoltán Kern). The 13th-century dendrochronology and radiocarbon dating of the wood used in the foundation coincides with the Early Arpadian Age dated by carbonized excavated from the foundation structure. We know the foundation of the structure could be complemented by the results of geophysical investigations (Ákos Petr.)

We summarize the results of interdisciplinary research, which shed new light on the role of Székesfehérvár as a center of power in 233

Oral

Szücsi, Frigyes – Szőllősy, Csilla (King St. Stephen Museum) – Morgós, András (Consart) – Horváth, Emil (In

Fabijanic, Tomislav (University of Zadar)

Poster

1.5.1. Embedded in European archaeology: the Carpathian Basin

Organisers: Típlic, Ion Marian (“Lúcan Blaga” University of Sibiu) – Fabijanic, Tomislav (University of Zadar) – Robák, 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 as Pohansko, Mikołów (Czech Republic), Gari-Thuana (Austria), Nitra, Bičina (Slovenia), Zalec, Škocjan and Karst (Slovenia), Bela Crkva (Yugoslavia), Tabula, Olomouc and Tábor (Czech), Pilsko, Velké Tomence (Bulgaria) i.e., and not just them. The archaeology of central places has provided us with 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?

Can we talk about the first apparition of churches, in urban or rural area?

REFERENCES

CENTRAL PLACES IN THE EARLY MEDIEVAL CARNIOLA?

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STONE FORTIFICATION AROUND THE 11TH-CENTURY SZÉKESFEHÉRVÁR: RESULTS OF AN INTERDISCIPLINARY RESEARCH

Abstract author(s): Szőcsi, Frigyes – Szőllősy, Csilla (King St. Stephen Museum) – Morgós, András (Constat) – Horváth, Emil (Independent 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 (University of Székesfehérvár, Faculty of Agricultural and Environmental Sciences, Department of Nature Conservation and Landscape Ecology) – Csókidi, Emese (Hungarian National Museum, Archaeological Heritage Protection Directorate)

Abstract format: Oral

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We summarize the results of interdisciplinary research, which shed new light on the role of Székesfehérvár as a center of power in
5 DEVELOPMENT OF EARLY CHRISTIAN ARCHITECTURE: KOSOVO CASE

Abstract author(s): Hoxha, Zana (Institute of Albanology) - Luci, Kamaj (Museum of Kosovo)

Abstract format: Oral

This paper focuses on Early Christian architecture in the territory of Kosovo. Kosovo lies on the southeastern part of Europe, precisely on the Illyrian 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 of Lion and Laura, in the Roman city of Ulpia in the 2nd century AD, while the first traces are architecture from Illyrian data from the 4th century AD. Through analysis of historical data and other available documents and archaeological mapping, forty six buildings of this type have been identified. The objective of this paper 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.

FUNERARY RITUALS IN DOBRUDJA (ROMANIA) IN THE 10TH - 11TH CENTURIES AD

Abstract author(s): Radu, Petru - Petcu-Leveli, Ingrid (Museum of National History and Archaeology from Constanta)

Abstract format: Poster

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 funerary rite and ritual. In an extant overview, it’s revealed as an intertextual puzzle between the interlocking local populations which forms an integer, combining customs and traditions. The influence 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 steppe, as well as about their Christianization and the joining and transition from the pagan to Christian funerary ritual.

262 MODERN NETWORKS AND PAST NARRATIVES: ‘TREASURE HUNTING’, THE ART MARKET, SCIENTIFIC ANALYSIS, AND CO-OPERATION FOR PROTECTION OF ARCHAEOLOGICAL HERITAGE

Abstract author(s): Deckers, Pieterjan (Centre for Urban Network Evolutions - UrbNet, Aarhus University) - Lewis, Michael (Portable Antiquities Scheme, British Museum)

Abstract format: Oral

‘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. 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.

2 DESTROYING THEIR CULTURE TO PROTECT OUR PRECIOUSSSSSS? ‘TREASURE HUNTING’ AS INTANGIBLE HERITAGE

Abstract author(s): Karl, Raimund (Bangor University)

Abstract format: Oral

Art. 27 (1) of 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 and which are 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’.

But to whose culture and practices (etc.) do these beautiful words apply to? Literally to everyone’s, as the UHHR demands? Or only to some, to those who see more equal than others, whose culture is superior to those of some others?

‘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.

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?

3 DAMAGES TO ARCHAEOLOGICAL HERITAGE RESULTING FROM UNAUTHORIZED EXCAVATIONS: SOCIO-ECONOMIC CONSEQUENCES AND LEGAL ASPECTS

Abstract author(s): Kaarls, Andrís (Riga Technical University) - Olewska, Irina (ArtLaw.club)

Abstract format: Oral

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 perspectives, but also a range of socio-economic losses.

Considering social, cultural 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/legal activities and how justified is the 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”).
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 analysing the situation in Latvia and other countries and based on the findings of archaeological science, 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 ARCHAELOGICAL NARRATIVE OF A BRONZE DEPOSIT IN EASTERN ROMANIA

Abstract author(s): Bolohan, Neculai (Alexandru Ioan Cuza University of Iasi) - Gafancu, Alexandru Marian (Complexul Muzeul 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. The discovery was rewarded by a prime minister and thus the boom followed. As metal discoveries multiply, the need to build the story behind these discoveries dramatically decreases.

In what I will present some case studies regarding the hunt for metal treasures and the manner in which those 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 discoverers, 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-crap.

5 COLLECTION-DRIVEN EXPLOITATION OF THE ARCHAEOLOGICAL RECORD: WHO IS NETWORKING WITH WHOM AND WHY?

Abstract author(s): Godfrey, Evelyne (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 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 decontextualized artefacts. As a result of their constant and unceasing 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 resources from this kind of unacceptable 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): Giovannelli, Riccardo (Università Ca’ Foscari Venezia)

Abstract format: Oral

What’s the shape of the antiques 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 changed such a showcase that has been always focused more in deep on the shape of the highest value Roman antiquities market on the same platform, in particular reflecting on the market? Or has the power of the “touch to pay” technologies and e-markets also changed such a showcase that has been always focused more in deep on the shape of the highest value Roman antiquities market on the same platform, in particular reflecting on the market?

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7 INVESTIGATING THE PROVENANCE OF EGYPTIAN BLUE PIGMENTS IN ANCIENT ROMAN POLYCHROMY

Abstract author(s): Rodier, Alexandra - Matthews, Sarah (Analytical, Environmental and Geo-Chemistry Research Group, Department of Chemistry, Vrije Universiteit Brussel) - Artik, Gibrato (Department of Geosciences, University of Padova) - Brens, Cecilia (The Ny Carlsberg Glyptotek) - Godez, 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 polychromatic and terracotta reliefs dated between c. 50 BC and 60 AD 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 assumed to be from Rome or elsewhere in Central Italy. While the real identity of the Campana reliefs has been lost, the pigment analysis, non-invasive investigation included XRF analysis of the pigment layers, 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. 2300 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 sources 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 isotope 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.

FORMULATING A CODE OF ETHICS FOR THE SCIENTIFIC ANALYSIS OF ARCHAEOLOGICAL MATERIALS

Abstract author(s): Mildeinger, Marianne (University of Goanio) - Godfrey, Evelyne (Uffington Heritage Watch) - Kariss, Andris (Riga Technical University) - Hajdas, Ika (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 salability, 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) - Siosí, Exzer (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 interdisciplinary 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-
ABSTRACTS

1 INTRODUCTION TO THE SESSION
Abstract author(s): Szabó, Dóra (University of Exeter)
Elliott, Sarah - Jenkins, Emma (Bournemouth University) - Palmer, Carol (Council for British Research in the Middle East)
Burkhardt, Laura (Institute for Oriental and European Archaeology)

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 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 evochemoarchaeology to gain further insights.

The presentation is based on a recently finished Ph.D. thesis 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.

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) - Alcock, Samantha (University of Plymouth)

The Neolithic settlements in southeast Asia are an important period in human history which saw the advent of agriculture and, ultimately, the rise of complex societies. It is also 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.

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3 PLANT PROCESSING ACTIVITIES AT HOUSEHOLD’S LEVELS - A MULTIPROXY APPROACH TO THE USE OF SPACE AT ÇATALHÖYÜK
Abstract author(s): Santiago-Marriero, Carlos - Lamelolotti, Carla - Madella, Marco (Université Pompeu Fabra)

Çatalhöyük is a Neolithic site located on the Konya plain, Turkey. Since its discovery in the early 1960s, 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 this site has been produced by the interpretative potential of the macro-botanical and artefactual remains. However, interpreting household 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.). This 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 evidence 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 SHERS TO EVERYDAY PRACTICES: THE GOLDOMINERS’ SETTLEMENT AT ADA TEPE (LBA)
Abstract author(s): Burkhardt, Laura (Instituto for Oriental and European Archaeology)

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 pluri-historic 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. Popp, who led his team of the National Institute of Museum with Museum of the Bulgarian Academy of Sciences from 2003 to 2011. The excavated data was analysed within the project “Bronez Age Gold Road of the Balkans - Ada Tepe mining” (PI: B. Horejš, funded by the FWF, project no. P-29452) 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. Horejš, H. Popp, R. Kral). This includes the project’s results and focuses on the Northeastern Settlement, which was then inhabited by the specialized goldsmiths.

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 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): Puntmann, Pernilla (Museum of Northern Zealand)

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 the cause of 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 large and promising group of finds, followed by bone artefacts, but also single finds with specific use-wear qualities have proven 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.
UNLOCKING BUILDING BIOGRAPHIES DURING THE LATE BRONZE AGE IN CENTRAL MACEDONIA: THE CASE OF THE THESSALONIKI TOMBIA TELL SETTLEMENT

Abstract author(s): Efkleidou, Kalogra - Karantonis, Maria - Triantaphyllou, Sivasti - 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 small, high and steep-sided tell-type settlements, known locally as tumbs (sing. toumba). Excavation at Thessaloniki Tombia demonstrates a distinctive fixation of the community on the faithful reproduction of the settlement's layout and the external boundaries of the tell 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 GIS environment and facilitates the reconstruction of the biography of individual buildings as structures which as such as also as social units 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.

9

RECONSIDERING 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.

COLD CASE AND SMOKING QUN. ROMAN IMPERIAL AND LATE ANTIQUE DWELLINGS IN EPHESOS

Abstract author(s): Schwager, Helmut - Ladstätter, Sabine (Austrian Archaeological Institute)

Abstract format: Oral

The several dwellings of Terrace House 2 in Ephesus 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 fires also indicate a multi-functional usage of the house entities. Parts of the house 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 architectural layout. Structured as parasite courtyards houses, they use the same spatial solution – however in different ways. The paper tries to present the organisation 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 organisation of Late Antique / Early Byzantine households.

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. Horden (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, 2015) 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 provides the potential for social interconnections.

Finally, we can discuss the intramural and domestic scale of individual households, the scale of the town and the scale at which those towns engaged on the wider European stage – Horden’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.
Refuse… or reuse? Waste management under the microscope at Százhalombatta-Földek - Bronze age Tell settlement

Abstract authors: Kovács, Gabriella - Vicze, Magdolna (Matrica Museum)

Abstract format: Oral

Százhalombatta-Földek 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 insights into various aspects of daily routines. One of those is waste management. There are those aspects of refuse management that are under investigation here. These are cleaning and maintaining construction and dumping. Sampling and analysing house interiors revealed that the need for cleanliness 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 showed wide diversity in the selection and application. In some cases, probably 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.

Storage as a significant part of the household activities: Diachron analysis of the storage pits from Bérettőújfalu-Papp-zug (East Hungary)

Abstract authors: Kása, Pékett - Fózosi, András (Évtfolyam Lőrinc University, Institute of Archaeological Sciences)

Abstract format: Poster

Household is a widely used concept 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 to this challenge during several millennia. In the Corinthian Basin there is 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 Bérettőújfalu-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 (c. 6000 BC) to the late Migration period (c. 9th century AD). A significant part of the 2389 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.

Civitas: A proposal for typological classification

Abstract authors: Silva, Iolanda (Islanda 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 was not considered feasible for two reasons: it was considered unrepeatable and it was thought that the group had a morphological range that should be understood that its productions were exclusively local, making knowledge and consequent elaboration of geographical parallelisms impossible. The negative connotation inherent in Common Ware within this thought, giving the concept to all ceramics that did not fit 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 significant proportion of research had been created. Although the boundary 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 perceptions of populations. They are economic indicators, socialisation components and techniques 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 atypical models detected in Conímbriga, plus perceiving a first attempt to typological and technological evolutionary lines of that Common Ware. Through physical and technological methods, based on a form-function proposition, ceramic as the case of the population of Conimbriga. For a finer assessment, i.e. trying to determine which foodstuffs have been in contact with our Common Wares, we will use nano spectroscopy, through these we have an first understanding of eating habits.
1 INTELLECTUAL IDEA AND FAMILY NETWORKS IN 18TH-CENTURY COLLECTION PRACTICE OF PREHISTORIC AND ARCHAEOLOGICAL OBJECTS IN THE GERMAN LANDS

Abstract author(s): Egplor, Kirsten (Goethe Research Centre of the University of Erfurt)

Abstract format: Oral

The Oleari, 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 a exchange of objects and ideas. During personal visits those early amateur archaeologists showed each other collections and artifacts, discussing uses, origin, the archaeological record, circumstances of their findings or their position and geographic direction in detail. To build stronger interpersonal bonds the Oleari got archaeological objects as gifts.

Collection and network activities of the Oleari resulted in two famous publications engaging with those artifacts and their cultural historical interpretation and classification like usage and age – but did not cross the limits of the given biblical timeframe.

“Historia Urna Sepulcralis Sarmatica” 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 Christoph Olearius (1668-1747). Intra- and extra-familiar 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 precursor to the following developments in prehistory and its often new evolving scholarly networks in the 19th century and thus contributing to an “archeology before prehistoric archeology”.

2 "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 as a corporation, due to the rise for the first thirty years 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 founding members of the MPM: its first director, Carl (Charles) Dörflinger and Adolph Moencke, charged with overseeing the design and construction of the first museum building. Moencke’s letters to Dörflinger during a trip to Europe in 1894/1895 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.

3 ANTiquarianism as the ’NOBLEST STUDY’; JOSEPH MAYER’S CULTURAL CONTRIBUTION TO THE GLOry of the LITERATURE

Abstract author(s): Effross, Bonnie (University of Liverpool)

Abstract format: Oral

Joseph Mayer (1818-1900) was a highly successful goldsmith based for much of his adult life in Liverpool, England. His antiquarian collections were utilized by him as both locally to promote his own activities, and abroad, were sufficiently prolific for him to open an Egyptian museum in Liverpool’s Colquitt Street in 1865. Most famously, he also acquired the eighteenth-century Fussaett collection of Anglo-Saxon antiquities from Kent 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 (1865). However, in May 1941, a German incendiary bomb severely damaged the museum and forced its closure for the decades; when the museum fully reopened in 1966, the gallery in its 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.

4 AGA MONTELLIUS & 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 (CIAP) 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’s “La Civilisation Primaire en Italie” 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 under the guiding of 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 important for her charity work.

Furthermore, this paper addresses practices, such as the organization of archives, which have contributed to the invisibility of certain actors in the creation of archaeological knowledge. Agda Montelius’ extensive travelling and work alongside Oscar, documenting finds in European museums, might have been unusual at the time. However, more invisible female participation in research activity 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, Kleaanti (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 impediments 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 publication studies will be presented: Sami Papasyridi-Karouzou (the first woman archaeologist in the Greek Archaeological Service in 1921), Anna Apostolakou (the first woman full member of the Archaeological Society in 1906) and Irene Varou- che Christodouloupolou (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 Hill (who, carried out excavations in the Moian 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 (1890-1973) and Tessa Vernon Wheeler (1893-1956). It approaches a social history of archaeology as a many women excavation-directors as men came up through the hierarchy of these projects, with an example of the 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 following the logic of contemporary ideas on cross-channel connections in prehistory.

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 knew very little about the history and archaeology of the Subcontinent. In his 1960 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 archaeological survey methods. His letters reveal Wheeler’s interaction with his students from across the British Empire, and scholars in other disciplines. It productively linked a number of older and newer British archaeological institutions (the University of London, the London Museum, the Archaeological Institute, the Society of Antiquaries, regional museums and societies) and ended following the logic of contemporary ideas on cross-channel connections in prehistory.

8 KIRALY PÁL – RESEARCHER OF THE ROMAN AGE

Abstract author(s): Bodó, Cristina (Muzeul Civilizației Dacie și Romane, Deva)

Abstract format: Oral

The History and Archaeology Society of Hunedoara County was founded in Deva in 1880. Archæological researches had begun in several locations of the country 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. Király Pál, a Roman archaeologist, has an outstanding knowledge of the Roman period and has directed numerous archaeological projects.

Just like many of the enthusiastic active members of the newly established Society, Király Pál was a teacher at the Superior Royal Hungarian Real School of Deva. He became closely acquainted with the results of the respective researches; in the Mithraic studies at Sarmizegetusa and the Mithraic studies at the Hunedoara History Society, providing his talent in drawing and photography until 1957. His 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 following the logic of contemporary ideas on cross-channel connections in prehistory.

9 SZINTE GÁBOR AND THE BEGINNINGS OF THE RESEARCH ON THE MEDIEVAL MONUMENTS FROM HUNEDOARA COUNTY

Abstract author(s): Codrea, Ionut - Bodó, Cristina (Muzeul Civilizației Dacie și Romane)

Abstract format: Oral

Founded in 1890, 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 1889-1890, he was appointed as drawing teacher at the Superior Royal Hungarian Real School of Deva. He became immediately a member of the Hunedoara History Society, providing his talent in drawing and photography until 1957. His 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 following the logic of contemporary ideas on cross-channel connections in prehistory.

10 ARCHAEOLOGICAL SCHOLARLY SOCIETIES IN THE KINGDOM OF YUGOSLAVIA: CHANGING STATES AND ROLES

Abstract author(s): Leber, 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 will examine the processes of professional illustration and photography into nineteenth-century Transylvanian archaeology.

This paper examines the modes in which Szinte Gábor’s network of archaeologists, historians, collectors and other enthusiasts, for med within the Hunedoara History and Archaeology Society, contributed to expanding his research interests, as well as the incorporation of professional illustrations and photography into nineteenth-century Transylvanian archaeology.

11 CONGRESSES AS NETWORKING HUBS: THE INTERNATIONAL CONGRESS OF PREHISTORY AND ITS ROLE IN SHAPING PREHISTORIC ARCHAEOLOGY IN NINETEENTH-CENTURY HUNGARY

Abstract author(s): Colfoan-Aranzau, Laura (University of Barcelona)

Abstract format: Oral

Congress and conferences were and are still 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 (CIAP), an international Congress of Prehistory, founded by Eduard Dörner 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 CIAP's as networking hubs in nineteenth-century archaeology by focusing on the case study of the 1868 CIAP 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 CIAP 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, excursions, 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 1969 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. Annie T. Gleeson 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 organised 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. Nineteen 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 SNMs 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 SNM network.

14 NORDIC NETWORKS AND THE VÖLKSCH 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 cooperation between Irish folklorists and Célticists, 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 folkloric 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 artifacts 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.

15 CAUGHT IN THE CROSSFIRE? MIODRAG GRIBIĆ 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 social vacuum. By reconsidering consequential aspects of the network created between Serbian archaeologist Miodrag Gribić (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 Gradštetić near Lake Ohrid (1931/1932) in present-day North Macedonia. In the same year, the American School of Prehistoric Research led by Vladimir Fowkes (1901-1944), Czech-born American archaeologist, began excavating Srećav, an early Neolithic settlement near Belgrade. As a prehistorian and curator of the National Museum in Belgrade, Gribić 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 Gribić created showed 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): Crisì, Antonio (Sant’Anna 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 Mancini (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 Mancini 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 (Maria 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 Mancini, as the Director of the Palermo Museum and Superintendent (the ‘first woman with such roles in Sicily’), dealt with the construction of anti-air 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 (IHEC - Instituto Universitário da Ericeira; Universidade de Lisboa)

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 century. Initially, the influence was predominantly French, but then German archaeology was gradually introduced in the country by Spanish colleagues. 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 style, as well as to a renewed scientific policy, Portuguese archaeology benefited 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.

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

**Organisers:** Georgiadis, Mercourios (Institute of Classical Archaeology in Catalonia) - Kefalidou, Eurydice (University of Athens)

**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 focused 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 throughout 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 possible "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 a 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 programs) the various -continuous, evolving or alternating- ways of exploiting and managing the objects, 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/adapting has a significant symbolic meaning with a strong cultural character from the prehistoric times until today.

2 THE REUSE, RECYCLING AND MODIFICATION OF OBJECTS AND LANDSCAPE IN AEGEAN PREHISTORY

**Abstract author(s):** Georgiadis, Mercourios (Institute of Classical Archaeology in Catalonia)

**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 behaviors. The focus of this session 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 were reused and even in some sense recycled in pre-historic 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, may 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 REVELING USING PATTERNS OF REPAIR AND MODIFICATION AS INDIRECT EVIDENCE TO UNDERSTAND METAL RECYCLING

**Abstract author(s):** Aulsebrook, Stephanie (Uniwersytet Warszawski)

**Abstract format:** Oral

The ways in which metal artifacts can be recycled, potentially obliterating all traces of their former use, means that metalworking 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 metal I am collating as part of the ongoing project ‘Forging Society at Mycenaean: the Relationships between People and Metals’.

4 SECONDARY TREATMENT OF DEATH IN ABDERA

**Abstract author(s):** Dimakis, Nikolaos (University of Athens)

**Abstract format:** Oral

Archaeological studies of mortuary practices in Classical Greece focus on 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, fragmentary or "out-of-context/circulation" burial offerings, accumulated or scattered around skeletal remains (disjecta 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-funerary interference with the long deceased 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 archaeological analysis, attention has been drawn on a number of graves from Abdirr-Hellenistic Abdera that demonstrate a promising field to investigate the re-engagement with the dead in post-funerary 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):** Acoro Perez, Jesus (Centre of Archaeology at the University of Lisbon - UNIARQ, Fundação para a Ciência e a Tecnologia - FCT)

**Abstract format:** Oral

In 2000, archaeologist Emilio Rodriguez-Rímeda 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 "abandoned" 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, analyzing its different modalities according to the type of material-metallic and glass artifacts, pottery, building materials, wooden furniture, textiles and even other materials 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 benefited 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:** Theories and methods in archaeology: interactions between disciplines

**Organisers:** Kustina, Pet (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Bickos, Penny (Department of Archaeology, University of York) - Tampota, 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 in a general unity of material culture or generic 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
DIETARY HABITS AND NEOLITHIZATION IN THE CENTRAL BALKANS THROUGH DENTAL BUCKL vulgaris AND ISOTOPE ANALYSIS

Abstract author(s): Markovikj, Jelena (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Jovanović, Ivana (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Stefanović, Sofija (Bioarchaeology Institute, University of Novi Sad, Serbia, Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Romaro, Alexandra (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, life-style, social structures and demographic patterns. Nonetheless, some recently published regional 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 Balkan processes in this context provides a particular scenario to explore forager’s and farmers’ dietary behaviors from different social, cultural and environmental perspectives. In this study, we analyzed 70 postcranial bioarchaeological samples from individuals of different chronological periods of interest in this region. The studied of the Neolithic Beiny 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 Neolithisation should not be seen as a straightforward process of acculturation, but rather represents more complex behavioral and cultural interactions and transmissions.

POST-MARITAL RESIDENCE PATTERNS IN EARLY NEOLITHIC CENTRAL EUROPE: MODELS BEYOND THE BIOARCHAEOLOGY

Abstract author(s): Hincır, Vazısay - Kvitova, Patř (Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague) - Vondrovska, Vozal (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 matrilocal 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 and Vladarice (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, abandonment 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 geographic space, and propose a hypothetical model combining different post-marital rules on different social levels.

URBANIZING FOOD: GROUND STONE IMPLEMENTS AND THE SOCIAL PERCEPTION OF FOOD PROCESSING IN THE EARLY BRONZE AGE IN SOUTHERN LEVANT

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

Abstract format: Oral

Urbanization developed differentially throughout history, related 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 centres are smaller and seem 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 expansion. Surplus food procurement secures the well-being of urban and adjacent communities in the situation of poor harvest or crisis. This creates the need to control agricultural yields, storage, food production and distribution, and support 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.

3 HOW ARE NEOLITHIC RANDELS RELATED TO THE CONCEPT OF ARCHAEOLOGICAL CULTURES?

Abstract author(s): Bidik, Jaroslav - Kvetina, Petr (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 randels, which consist of circular V-shaped ditches with inner concentric palsade trenches, interrupted by two to four entrances. Randles are dated to the late Neolithic (central European chronology), to a relatively short time span of approximately 4800–4700 cal BC. About two hundred randels are presently known, located in the geographical area of four major archaeological cultures in Central Europe. The archaeological record of each of the cultures demonstrates both independence and interconnectivity. There are differences in house layout, 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 vessels 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?
The current paper explores food production strategies and foodways during the Early Bronze Age I-III based on food processing ground stone tools. The study involves typo-morphological analysis of stone tools cross-referenced with data on raw material accessibility, environmental variables and archaeobotanical and zooarchaeological databases. The research scope is composed of artefacts derived from sites located in modern-day Israel, as well as published data from neighbouring countries, representing different stages of Early Bronze Age and economic development as well as geographic variability. The research reconstructs the traditions regarding food processing in those settlements, analysing space organization, size, design and durability of tools and the phenomenon of their secondary and multifunctional use.

COOKING POTS, FOOD AND SHARED ORDINARY PRACTICES
Abstract author(s): Ľymperáski, Mariana - Üren-Kötös, Duska (Damoctius University of Thessрастhe) - Kötös, Sztavros (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 formation of the 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, daily practices and are thus a powerful tool for better understanding the way the food preparation and consumption 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 are 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 microbiological (starch and phytolith) analysis of food remains in cooking pots provide further insight into the domestic preparation and consumption of food.

LIFESTYLE OF LATE NEOLITHIC AND EARLY ENEOlITHIC POPULATIONS FROM MORAVIA AND EASTERN BOHEMIA (CZECH REPUBLIC) BASED ON BIOARCHAEOLOGICAL RECORDS
Abstract author(s): Turid, Zdenek (Anthropos Institute, Moravian Museum, Brno) - Jarošová, Ivana (Freelancer in anthropology) - Drtikolová Kaupová,Sylva (Department of Anthropology, National Museum in Prague)
Abstract format: Oral
Past LBK Neolithic and Early Eneolithic period (ca. 4900 - 3500 BC) in Moravia and eastern Bohemia (Czech Republic) is in classic archaeological conception represented by Stroked Pottery culture (SBK), Lengyel culture (LC) and Funnel Beaker Culture (TB). 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 dietary 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 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.

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 embedded 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 subjective 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) - Escrivan-Bruz, 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 1400-1850 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.

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 that 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): Escrivan-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 historical accounts have attempted to argue 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 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 try 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.
BRIDGING TWO WORLDS: COLONIAL WALL PAINTINGS FROM CHAJUL (GUATEMALA) AND THEIR SIGNIFICANCE FOR LATIN AMERICAN ART AND CULTURE

Abstract authors: Ziska, Jaroslav · Radimčik, Katarzyna · Banach, Monika (Jagiellonian University) · Maciej, Akradzuk · Vojtěšek, Jiří · Lunis (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 peoples 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 has kept 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.

BUILDING FRONTIERS: DISCOURSES AND PRACTICES

Abstract author(s): Marin-Aguale, Beatriz (University of Cambridge)

Abstract format: Oral

Chila 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 frontier, 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.

THE USE OF GIS TOOLS AND SYSTEMS THINKING IN LANDSCAPE RESEARCH OF THE EARLY MEDIEVAL MARCH OF PTUJ

Abstract author(s): Magdile, Andrej (Institute for the Protection of Cultural Heritage of Slovenia)

Abstract format: Oral

The interpretation of the ‘authenticity’ 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 21st 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 [Maribor-Ptujiški], 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 J-9450), which is financially supported by the Slovenian Research Agency.

INTEGRATING HARD GEOARCHAEOLOGICAL DATA INTO INTERPRETATION OF KEY THEMES IN MEDIEVAL ARCHAEOLOGY

Abstract author(s): Banerjee, 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 geoarchaeology has to play in informing the heritage management decisions relating to the burial archaeology of European castle sites.

INTEGRATING HARD DATA IN THE INTERPRETATION OF MEDIEVAL ARCHAEOLOGY: EXAMPLES, ISSUES, AND PERSPECTIVES

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

Organisers: Had, Marta (Vrije Universiteit Brussel, Maritime Cultures Research Institute) · Magdile, 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 (sensus 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 step 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 research presents an overview of how GIS and systems thinking can answer this demand by focusing on daily life objects that built imperial and resistant practices, creating hybrid performances.

PROBLEMS AND OPPORTUNITIES OF GIS AS A RESEARCH TOOL IN (POST)MEDIEVAL ARCHAEOLOGY

Abstract author(s): Novaković, 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 but GIS studies were most numerous (and successful) in prehistoric archaeology. Historical (medieval and postmedieval) archaeology was the least successful in applying GIS but GIS studies were most numerous (and successful) in prehistoric archaeology. Historical (medieval and postmedieval) archaeology was the least successful in applying GIS but GIS studies were most numerous (and successful) in prehistoric archaeology. Historical (medieval and postmedieval) archaeology was the least successful in applying GIS but GIS studies were most numerous (and successful) in prehistoric archaeology. Historical (medieval and postmedieval) archaeology was the least successful in applying GIS but GIS studies were most numerous (and successful) in prehistoric archaeology. Historical (medieval and postmedieval) archaeology was the least successful in applying GIS but GIS studies were most numerous (and successful) in prehistoric archaeology.
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 and 15th century. This increase in population led the city to transform from a small 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 recognize 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.

ANALYTICAL TECHNIQUES IN THE TOOLBOX OF EARLY MEDIEVAL ARCHAEOLOGY: POTENTIAL AND LIMITATIONS. EXAMPLES FROM THE CRUMBEL PROJECT, BELGIUM

Abstract author(s): Capuzzo, Giacomo (Université Libre de Bruxelles) - Veselka, Barbara (Vrije Universiteit Brussel) - Dalle, Sarah (Ghent University) - Vermaeten, Martine (Université Libre de Bruxelles) - De Muylder, Guy (Ghent University) - Sneeck, Christophe (Vrije Universiteit Brussel; Université Libre de Bruxelles) - Tyès, Diria (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 understood 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 analyses, 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.

HOW TO TRACE AND DESCRIBE SOCIAL DEVELOPMENTS IN EARLY MEDIEVAL SOCIETIES BASED ON ARCHAEOLOGICAL SOURCES? THE CASE STUDY OF CARANTANIA

Abstract author(s): Eicher, 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-archaeological 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 man”, “big men” and “chiefs.”

QUESTIONS FROM THE HEART OF THE FIRE: USING STRONTIUM ISOTOPES TO EXPLORE HUMAN-ANIMAL RELATIONSHIPS AT A VIKING CREMATION CEMETERY

Abstract author(s): Loefelmann, Tassia (University of Durham) - Cleary, Philippe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel, AMGIC-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, AMGIC-WE-VUB; O-Timo 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 bowl cemetery at Heathcote, 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 1996-2000 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.

IS A FISH ALWAYS A FISH? PERSPECTIVES FROM PREHISTORIC AND MEDIEVAL ARCHAEOZOOLOGY

Abstract author(s): Zvolevic, 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 skill to assemble the archaeological record, 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 to “the Animal Turn” 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 11th-16th 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 draws heavily from hunter-fisher-gatherer relational ontologies, whereas the latter was carried 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.

THE ZOOARCHAEOLOGY OF THE BALTIC CRUSADER STATES: DATA AND THEORY

Abstract author(s): Piuskowksi, 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 regimes constructed castles, encouraged colonisers, 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 that 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 accounting 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?
NETWORKS AS RESOURCES FOR ANCIENT COMMUNITIES

1. Networks, networking, communication: archaeology of interactions

Organisers: Da Vinci, Raffaella (Universität Tübingen, SFB1070 Resource Cultures, Institut für Klassische Archäologie) - Francesca Mazzilli, 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 (sources, 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 topics: networks jointly or separately on archaeological, environmental, topographic/archaeological data across the Mediterranean and beyond. Contributions 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?

2. 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?

3. 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?

4. 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?

5. 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): Tommi, Francesca (University of Liverpool)

Abstract format: Oral

Wasters, kiln technology and firing processes have been largely studied as key features of pottery production, but a wider analysis of kiln 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 to their broader landscape setting. Combining geospatial analysis through GIS with archaeological and ethnographic 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): Chale-Adams, Dibnamier - Bartheilme, Martin - Diaz-Zortia Bonilla, Marta (SFB 1070 RessourcienKooperation, 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 wares 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 or territories; they can also represent or reflect networks of relationships, where knowledge flowed 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 cults of Jupiter Dolichenus, Theseus Hypsistos, Zeus Kasios and Syrian cults), a more recent project (GEHR) 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 an Maria 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 affective 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 node. 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 networks 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 affective network analysis.

4 SACRED LANDSCAPES OF THE SOUTHERN GREECE FROM MYCENAEAN TO ARCHAIC TIMES: A COMPARATIVE APPROACH

Abstract author(s): Vazou, Afrodis - Salvatoura, 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 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 shrines found along major roads 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 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.
“Foodways” (production, preparation, consumption and distribution of food) can, according to the definition of the CRC 1070 ResourceCultures, accumulated traces of diet and pathologies reveal connections but also exclusions from sociocultural groups and mechanisms of the body itself, preserve information on the specific position of a person during life (functional data) and in death (intentional data, mental data). Through the illustration and analysis of the contexts related to the period between the 10th and the 6th cent. BC, this abstract format: 

Abstract author(s): Raffaella Da Vela, Valerie Palmowski

 Oral

Da Vela, Raffaella (SFB1070 RessourcenKulturen University of Tübingen)

- Palmowski, Valerie (University Tübingen; CRC 1070 ResourceCultures)

 It is our hope that the proposed frameworks will provide fruitful discussions of the benefits of foodways were actively used to create identities and / or open societies up to intercultural contact in the Viking Age.

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.

THE APENNINE (6TH–1ST CENTURIES BCE)

NETWORKS OF CULT PRACTICES AS RESOURCES OF COHESION IN TRANSHUMANCE SOCIETIES OF THE APENNINE 6TH–1ST CENTURIES BCE)

Abstract author(s): Da Vela, Raffaella (SFB1070 RessourcenKulturen University of Tübingen)

Abstract format: Oral

The present contribution approaches religious networks as resources to create social cohesion in transhumant communities 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.

Main research questions address the function of religious networks in communities organized in sparse settlements in the mountain regions (vicoatim) 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: Enuova in the North and Hipiriana in the South. The database consists of topographic data (positions of local communities and the diffusion of cult practices) as well as the archaeological record (depositions of votive materials and typologies 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 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.

6 NETWORKS AND SOCIAL POWER IN ARCHAIKA KAMiROS (RHODES, GREECE)

Abstract author(s): Bossozino, Isaballa (Università degli Studi di Pavia/Università Paris 1 Pantheon-Sorbonne)

Abstract format: Oral

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.

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 Archaike period can provide us with some fundamental insight, 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) perspective. 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.

7 DANISH SITE, GOTLANDIC JEWELLERY, SLAVIC PEAS – AND WHO S BURIED HERE? PLACING VIKING AGE BURIALS IN CONTEMPORARY NETWORKS WITH BIOARCHAEOLOGY

Abstract author(s): Palomowski, Valerie (University Tübingen; CRC 1070 ResourceCultures)

Abstract format: Oral

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 Iberian, from Germany to Russia. Few archaeological finds, e.g. a budha figure from Halø (Lake Mälaren), even attest (in)direct contact with China. Ambitioned sea voyages transported persons, objects, cultural ideas and offerings. Through this comparison between geographic and cultural determined networks within the same chronology, it is possible to inquire the role of 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.

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 religious 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 sephulchral 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 ethnic 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.

RIVERS AS SOCIO-NATURAL NETWORKS IN ETURIA

Abstract author(s): Francesco Ciniselli, Mariachiara (University of Freiburg)

Abstract format: Oral

"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 religious 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 sephulchral 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 ethnic 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.

279 NEOLITHIC AND BRONZE AGE TELLS AND THEIR NETWORKS IN THE CARPATHIAN BASIN AND BEYOND

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

Organisers: Pusztainé Fischl, Klara (University Miskolc) – Kliesel, Tobias (University Cologne) – Filczi, András (Étvtis Lőrinci University, Faculty of Humanities, Archaeological Department) – Rassmann, Knut – Bárff, Ester (RIGK)

Format: Regular session

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, it is our goal 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 relationships, whereby we can broaden the overall context 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.
1. TELL SITE OF THE LBC SZAKALHAT CULTURE AT MEZÖKERESZTES-LAPOSHALOM (NE HUNGARY)

Abstract author(s): Pusz tapered Fischl, Klára (University Miskolc) - Csengeri, Piroska (University of Northern Kentucky) - Hajdu, Melinda (University of Northern Kentucky) - Lató, Tamás - Pusztai, Tamás (Hungarian National Museum) - 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-East European prehistorians. The enclosure tell and the single-layer settlement (67.6 ha) represent a special and a residential area. The excavations discovered the internal dynamic 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 1999-2005 brought to light a large amount of archaeological finds. Ceramic, stone tools, metal finds and metal objects are the main components of the archaeological assemblages. The ceramic assemblage is the result of several different aspects of subsistence and social activities. In a diachronic tentatively modelled 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 Kural density method, and the timescale modeled by acronic approach. The multilevel interactions in the context of the human-rhing 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.

2. DOMESTIC AND SYMBOLIC ACTIVITIES ON A TELL-LIKE SETTLEMENT AT ÖCSÖD-KOVÁSHALOM IN THE TISZA REGION

Abstract author(s): Füzessy, András - Raczyky, Pál - Anders, Alexandra (Eötvös Loránd University) - Szalay, István - Szalay, Zsuzsanna - Tóth, Zsuzsanna (Eötvös Loránd University of Sciences, Institute of Archaeology)

Abstract format: Oral

Lying in the boundary zone between the Tisza and Körös landscapes, the Öcsöd-Kováshalom site represents a remarkable spatial organisation 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 ditch channels. 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 interrelations between quotidian and symbolic activity types and thus represent a site-specific interconnected taskscape configuration. The excavated archaeological features outline an area divided into concentric activity zones. These zones outline the setting of the interrelations between quotidian and symbolic activity types and thus represent a site-specific interconnected taskscape configuration. The special ritual paraphernalia, the burials and symbolic activities identified at Öcsöd, were mediums for expressing collective identity and integration, which they simultaneously also modulated 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 reflects the colourful diversity of community actions and their complex patterns as well as the dynamics of their spatio-temporal changes.

3. 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 - Brno), Haar (Romano-Germanic Commission) - Raczky, Pál (Institute of Archaeological Sciences ETE)

Abstract format: Oral

The spread of Neolithic lifeways, including sedentary life from Southeast - to Central Europe was accompanied by an increasing organisation of space, the structure of settlements, and also of house architecture. In the Afford region, the dynamic of this differentiation became accelerated in the period of transition from Late Neolithic to Copper Age (mid-5th millennium BC). It resulted in different regional traditions in settlement planning and systems of networks. The long term process of the mosaic of this variety has been seen in its interregional interconnectedness. Research projects in the last decades contributed a large 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 contradictory roles of the Vinka house roles (Zeisler/struktur) towards the development to a circular rather spatial connection in the Cucuteni-Tripolye Culture.

4. HINTERLAND OF NEOLITHIC AND BRONZE AGE TELLS. REGIONAL-SCALE GIS MODELLING AND ANALYSIS OF POLGÁR ISLAND, NE HUNGARY

Abstract author(s): Mesterházy, Gábor (Castle Estates Headquarters Integrated Development Centre Ltd.)

Abstract format: Oral

Many articles from the recent decades prove 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 database for this study is based on extended literature research, dating of older field survey artifacts. 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 these 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’ cover. The multi-annual GIS datasets proved to be useful for characterizing the settlement’s environmental context. Secondly, to improve the incomplete archaeological sites 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 analyze the characterization of least-cost path networks, like role of certain settlements in the network or frequency of certain routes.

5. BRONZE AGE MULTI-LAYERS SETTLEMENTS AND THEIR NETWORKS IN THE EASTERN CARPATHIAN BASIN. CASE STUDIES FROM WESTERN ROMANIA AND NORTH-EASTERN HUNGARY

Abstract author(s): Li, Marian (Institute of Archaeology) - Gáván, Alexandra - Kieni, Tobias (University Cologne) - Fischl, Klára (University Miskolc) - Zel, Lajos - Ripke, 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 Tobolú-Dúmba - Zárcának and two multi-layered sites from North-Eastern Hungary, Emőd-Nagylalm and Tőkőszög. All these multi-layered sites have similar material culture and have traditionally been ascribed to the Otomani-Füzessyabony 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 MUREŞ BASIN

Abstract author(s): Traxa, Andrei (West University of Timisoara) - Gogălan, Florin (Institute of Archeology and Art History, Cluj Napoca, West University of Timisoara)

Abstract format: Oral

Having in mind the idea of “diversity in uniformity” of the Middle Bronze Age (MBA) habitations, in this paper we want to highlight the similarities, but especially the differences of what the tell settlements supposed in the Lower Mureş Basin. To do so we will refer mainly to (1) the physical characteristics of the landscape speculated by each site; (2) the structures which can be depicted for each site - either by magnetometry or by orthophotopanels; (3) the relationship between the archaeological sites and the main resources (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 Mureş Basin we will present, as a case study, a new tell settlement found at Alézy-Válasz Alóú (Timiș county). The site is known since 2008, but only through the materials collected during the fieldwork 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 performed. Also the micro-landscape was highlighted through aerial photography and by the outputs of 3IM 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): Kucskó, 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 a 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 1976, with the support of the Hungarian Academy of Sciences, in the framework of a national program aimed at the research of the Neolithic and Bronze Age tell settlements. István Bóna and Ilona Stanczik and their colleagues have developed a new approach of the tell-excavation’s method. This methodology has remained decisive 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 early modern ruins of the church were surveyed by instrumental survey methods. In the second phase, complex non-destructive methods 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 landscape 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 (Danyjanish János Museum, Szikszó) - Daroczi, Tibor (Aarhus University, Department of Archaeology & Heritage Studies) - Csányi, Marietta - Tarnoki, Judit (Danyjanish János Museum, Szikszó)

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-Kápolnahalom is eminent by the innovative techniques and methodologies employed by the excavators in the 60’s and 70’s, while Türkser-Táralem impresive 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 want 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 ducks are attributed to the above-mentioned horizon, hence, a synchronicity is stated and perpetuated 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 possibility to study daub fragments in their original position.

My poster focuses on the daub fragments of the multi-storied building (House 11) from the Late Neolithic tell settlement of Polgár-Csősdalham. 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 architectural 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 analysis 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 environmental 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: 26. 26 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) - Holecek, Vinc (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 Landscape Archaeology, this year the Working Group wishes to convene a session 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 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 considerations.

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): Holroyd, Vincent - Pappy, 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 £900m 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 at relatively low-priority actions. Archaeological monuments were designated as Landscape Features in 2015 by the Department of Agriculture, Food and 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): Byrne, 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 sectoral, 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.

4 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 (DPGC) - Paiva, Bolaon (DRC Norte) - Mora, Helena (DRC Centro) - Malo, 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 affects of intensive forestry in the Portuguese territory for pulp production, an archaeological 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 archaeology, work related to forestry became residual, resurfacing in 2014 with the participation of Directorate-General for Cultural Heritage (DPGC) and the Regional Culture Directorates in the revisions of the certification standards, such as FSC and PEFC.

With the increase of wildlife, of dramatic proportions in the years 2018 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 DPGC 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.

5 SUSTAINABLE DEVELOPMENT OF HISTORICAL LANDSCAPE IN FORESTED AREAS

Abstract author(s): Žaža, Petr - Mazďíková, Jana - Půlčaf, Andrej - Vaničková, 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 historical environment – is a database of these anthropogenic relics for the members of the wider public, especially for land owners and construction companies.

6 NEW INSTRUMENTS FOR LANDSCAPE MANAGEMENT: THE BIOGOV TESTCASE OF THE GULP VALLEY

Abstract author(s): Cordenans, 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 Veerse, 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 result in a more robust climate-proof landscape where nature and cultural heritage conservation is realised in close cooperation with the local farmers.

7 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. 6500 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 mounds, large scale linear embank-
mments, standing stones, roadways, medieval ringfort settlement sites, and medieval field boundaries. The focal point of this land-
scape is a large-scale multi-period earthen mound, deemed to have been a site of communal gatherings and ceremonies connected
with prehistoric saga 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 Tan Bó Cuailgne.

This part of mid-Roscommon is famous for its qualities as a pastoral farming landscape. However, the combination of modern agricul-
tural practices and declining farm incomes has placed considerable stress on this well-preserved and 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 2010, 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 farm-
nerd 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: 3. Networks, networking, communication: archaeological 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 Eu-
eropean 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 mid-century, sometimes across political and military conflicts. It confronts issues of nation-

1. Networks, networking, communication: archaeology of interactions

2. Themes of professional and personal networks in archaeology

3. Case studies of networks and networking in mid-20th-century Europe

4. Reflections on the legacy of mid-20th-century 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
adopts 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 part in rallies; protesting about National Socialists
in the Spanish Civil War (1936-39), Childe rapidly became a high profile and committed critic of fascist regimes and scientific racism in
Germany. His activism included letters to the Press, lectures and writings; taking part in rallies; protesting about National Socialists

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 fas-
cist governments in Germany and Spain, archaeologists such as the German Hans Zeiss (1895-1944) and Spaniards educated in
Germany such as Julio Martínez Santa-Ólalla (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 archaeolo-
gy 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-Ólalla, Comisario General de Excavaciones since 1939, tried to
involve the Alhunear in his Visigothic investigations with a visit of the excavation of the important Visigothic cemetery of Ca-
thiara. 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-Ólalla, as a preparation
for the Institut's foundation on that theoretical base. In the and the Castillanos project failed, Werner returned without success, and
the DAI was founded in 1943 with a Christian archaeologist as his first director, Helmut Schlunk (1906-1992). After the troubles of
World War II, the DAI was reinstalled in 1964 with the same director. This paper examines the personal and political networks in Ger-
many 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.

FROM GERMANY TO POLAND OR ALWAYS IN BETWEEN – SILESIAN ARCHAEOLOGY BEFORE/AFTER 1945. REPLACED NETWORKS, REVERSED ANTAGONISMS, PERSISTING DISCOURSES
Abstract author(s): Refsteinbach, Karin (University of Leipzig)
Abstract format: Oral

The peculiar situation of Silesia, as a former German-Prussian province turned into the part of revived Polish state after 1945, pro-
vides 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 gov-
ernance, networks and institutions lead to a fundamental change of the research infrastructures. It will further discuss the interna-
tional 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 revision 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. "(proto-)
Slavic/(proto-) Polish" and thus as their national belonging.
THE IRON GATES RESCUE EXCAVATIONS PROJECT AND THE SHAPING OF ARCHAEOLOGY IN SOCIALIST YUGOSLAVIA

Abstract author(s): Jaromír, Gordana - Vitezovic, Selena (Institute of Archaeology Belgrade)

Abstract format: Oral

Based on our research on the reorganization of German Archaeology after World War II we will 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 1990s 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.

RACIAL SCIENCE AND MARRISM: CONTROVERSIAL IDEAS IN YUGOSLAVIAN ARCHAEOLOGY

Abstract author(s): Milosavljevic, Monika (University of Belgrade)

Abstract format: Oral

Yugoslav 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 legitimation through past nativization. One of the important fields therein was early medieval archaeology in association with medieval history, which sought to portray Southern Slavs or Yugoslavians as a homogeneous group. This homogenization was based on the theories of Nikole Vukovitch Man, 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 led to outdated ethnic theories to be applied in Yugoslavian archaeology.

THE ELEPHANT IN THE ROOM. DENazIFICATION AND ARCHAEOLOGICAL NETWORKING IN GERMANY AFTer 1945

Abstract author(s): Drumwald, 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 1990s 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.

INTERNATIONALISATION OF THE YUGOSLAV ARCHAEOLOGY AFTER THE SECOND WORLD WAR

Abstract author(s): Lorber, Crtoimir - Novakovic, Predrag (University of Ljubljana)

Abstract format: Oral

Archeology in the countries which belonged to Yugoslavia (1918 – 1992) was mosaic of different traditions and development trajectories greatly affected by significant political changes in the SE Europe in the last 150 years; all of them affected 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 1963, as the principal coordinating agency in the immediate post-war development of archaeological concepts and infrastructurally. While the society’s principal task was creating conditions for strengthened and planned cooperation of archeologists 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 conference, 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 Illicit 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.

EUROPEAN RESEARCH COUNCIL (ERC) GRANTS: WHAT ARE THEY, HOW TO APPLY?

Theme: 26 May after: The changing world and EAA’s impact and the 1995 EAA Annual Meeting in Santiago

Organisers: Grassi, Silvia (European Research Council) - Bakri, Julia (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 Q&A.

(Whether you are thinking of applying or just curious, this workshop might be a game-changer for your career.)

ROUND AROUND THE CIRCLE – CIRCULAR PHENOMENA AND THEIR MEANINGS IN EUROPEAN PREHISTORY

Theme: Networks, networking, communication: archaeology of interactions

Organisers: P. Bars, Andij – (Magyar Nemzeti Múzeum Régészeti Örökségvédelmi Igazgatóság) – Plaztor, Emília (Transylvania Múzeum, Baja) – Pusztafalvi Fischel, Klara (Miskolci Egyetem BT, Történeti kutatásm nested Intézet, Österrövidészet és Régészeti Tanszék) – Puszta, Tamás (Magyar Nemzeti Múzeum Régészeti Örökségvédelmi Igazgatóság) – Kovács, Járónosi (University of Hradec Králové, Filozófická fakulta, Katreda archeologie)

Format: Regular session

Circular building elements in space separate places from others. Enlining 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
Oral

Oral

Oral

Oral

We invite papers for this session from all periods of Prehistory starting from the Palaeolithic to the end of the Iron Age, where circular settlement systems, structures and sacral buildings were shaped by several factors: safety, community demand, worship, 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.

CLAIMING SPACE: NEOLITHIC ENCLOSURES IN THRACE

Abstract author(s): Nikolova, Nikolina - Bauwens, 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.

LIKE MUSHROOMS AFTER THE RAIN: NEOLITHIC CIRCLES IN THE SOUTHERN CARPATHIAN BASIN

Abstract author(s): Kalafatov, Hriňová - Šljeg, Bartul (Institute of Archaeology Zagreb) - Šolšek Kledičt, Rajna (Faculty of Humanities and Social Sciences)

Abstract format: Oral

Southern Carpathian Basin is a region situated between three major central European rivers: Dunav, Drava and Ilava. 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 such 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 grew 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.

FINDS OF RONDELS ON THE RIGHT TERRACE OF THE ELBE RIVER NEAR HRADEC KrÁLOVÉ (EASTERN BOHEMIA)

Abstract author(s): Kovaníčk, Jaromír (University of Hradec Králové) - Típál, Ján (Constantine the Philosopher in Nitra)

Abstract format: Oral

Thanks to the application of aerial archaeology, rondels of the Strakova Pottery culture (SKB), subphase IIa, were discovered on the right terrace of the Elbe River between the towns of Jarošov and Hradec Králové in eastern Bohemia. There were at least eight rondels in a length of 13.5 km from the north-northeast to the south-southwest. Of course, all rondels were not contemporaneous, 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 ditch entrances. For example the triple rondal Saonice 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 southwestern entrance to the triple rondal near Příčice s 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 in 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 hradište 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. the rondels on the very important right terrace of the elbe river were placed near confluences, which were also cross-sided by neolithic trackways. the round shape of the rondels could reflect the cyclicality of time.

3 PALISADES, 2 DITCHES 1 RECUT = 3 SUCCEEDING REPLICADED PHASES? A PROPOSED CONSTRUCTION-SEQUENCE OF THE BODZÓ RONDEL

abstract author(s): nobelstock, louis d. (universitet kardynala stefana wyszyńskiego w warszawi)

abstract format: oral

based on the results of the excavations at the rondel in bodzow in southeast-poland, i propose that multi-palisaded and ditched middle neolithic rondels are in fact multi-phase widely expanding enclosures. each of these phases was made up of a single post-built circle accompanied by a ditch. in bodzow, 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 half-lives. they suggest that far from being long-term monuments whose life spans 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.

NEOLITHIC CIRCLES. A MONUMENTAL PHENOMENON IN SOUTHERN SWEDEN

abstract author(s): do lorenz turner, david (stockholm university)

abstract format: oral

when studying monument construction in the neolithic period, there is a 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 excavations have 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. spatzier and bertemes demonstrate that this position should be reconsidered (2013). 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.

ROUND? CIRCULAR? OR? PATTERNS OF NEOLITHIC AND CHALCOLITHIC SETTLEMENT LAYOUTS IN THE SOUTHEASTERN AND EASTERN EUROPE

abstract author(s): hofmann, robert - shattle, liudmyla (kiel university, institut für prehisto-rikiarchaistic and protoarchaistic history, germany) - raissmann, knut (german archaeological institute, roman-germanic commission - rgi, frankfurt am main, germany) - müller, Johannes (Kiel university, institut für prehisto-rikiarchaistic and protoarchaistic history, germany)

abstract format: oral

large-scale 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 ‘tripolje’, in the forest-steppe zone east of the carpathians, on the other hand. settlement layouts are contextualized, 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 analysis, 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.

CIRCULAR ARRANGEMENT OF SPACE AT THE ENEOLITHIC SETTLEMENT OF LASINJA CULTURE AT ZGORJNE RADVANJE IN SLOVENIA

abstract author(s): kramberger, bine (institute for the protection of cultural heriatge of slovenia)

abstract format: oral

excavations (undertaken by the institute for the protection of the cultural heritage of slovenia between 2007 and 2008 at zgorjne radvanje, the southernmost part of maribor in northeast slovenia, yielded traces of a so far unique settlement of the lasinja cul- ture, dating to second half of the 6th 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 prevale. 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.

SYMBOLISM OF CIRCULAR SANCTUARIES AROUND 2000 BC - A CASE STUDY FROM CENTRAL GERMANY

abstract author(s): spätzler, andreas (landesamt für denkmalpflege baden-württemberg)

abstract format: oral

the rondels of plönmaala and schnönebeck, dating to the late 3rd and early 2nd millennium 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 2000 bc suggests 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 monu- ments. on the meso-regional level there may have been a complementary symbolism of both rondels. it can be suggested that plönmaala and schnönebeck represent a dialectic dualism, both having served specific, perhaps mutually exclusive purposes. they probably were anathemic ‘non-mundane’ focal points with a sacred landscape. furthermore, there is evidence for a symbiosis in the acts of building and abandoning circular sanctuaries as complex social pro- cesses. while schnönebeck the evidence indicates a multi-stage construction at plönmaala 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.

THE CIRCULAR SETTLEMENT PATTERN IN THE EARLY BRONZE AGE OF THE CARPATHIAN BASIN. THE BORBAS PROJECT

abstract author(s): puzstai, tamás (hungarian national museum) - puzstainé fischl, klára (university of miskolc) - kienlen, tobias (university cologne) - kertész, gabriella (herman ottó museum)

abstract format: oral

encoding 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 ‘borbás region bronze age settlement’ (borbás6) 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 millennium bc and the first half of the second millennium bc. the main elements of the settlement structures 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 artifacts 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 principles also on the ceramic and bronze artifacts from the investigated period. exactly is that why we think that this ‘pattern’ in the ordering of space on the one hand and as a stylistic element decorating artifacts, 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 authors: Jasiński, Rafal (Cardinal Stefan Wyszyński 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 issues of fortified settlements that are known from this area. They originality results from the characteristic topographic 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 19th and early 20th century by German and after World War II 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. 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.

VENUS FIGURINES AND CIRCULAR NATURE OF LIFE

Abstract author(s): Tabot, Amy (University of Bradford)

Abstract format: Poster

Based on research from Lodzmia lakóvéle (2015), this poster wishes to suggest that the temporary circular mammoth bone “Ye-ranga” or “tipi” structures as found across Central Europe and the Russian Plain in the Upper Palaeolithic may be in fact be centres for childbirth.

lakóvéle (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 Stiffer (1988), Pidoplichko et al (1998) and Svboda (2003) has based discussion around easy to build structures that are raised around the larger mammoth bone structures. Upon separate research (Tabot 2019) regarding the Central European Venus figurines, a correlation was observed where the figurines where often found in areas where the tipi or Ye-ranga 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 mothership 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 Marxist methodology of interpreting the sites holistically along side an Archaeology of Emotion the poster hopes to enable new discourse around motherhood, spirituality and childbirth in the Upper Palaeolithic.

NEW DISCOVERIES OF CIRCULAR DITCHES: ANCIENT MONUMENTS IN THE NORTH-WESTERN BLUE HORIZON

Abstract author(s): Kucharik, Milan - Blažková, Tereza (Labrys o.p.s.)

Abstract format: Poster

The poster presents newly discovered prehistoric sites in North-East Bohemia, Czech Republic. Dry weather of last few years has revealed previously unknown prehistoric sites with circular ditches. We have discovered Late Neolithic circular ditch enclosure (rondel) in Hradec Králové - Hukleny 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 continous. 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 Děbalčík and Mízany (Hradec Králové district). These are probably ditches surrounding the foot of the burial mounds of the Bronze Age origin.

CIRCULAR PIT ALIGNMENT AT AN EARLY BRONZE AGE SETTLEMENT NEAR TO SZE Gordon (HU)

Abstract author(s): Szlaznai, 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-Subasa, site. A number of circular pits were described in the late 19th and early 20th century by German and after World War II Polish archaeologists. Unfortunately, most of these sites were 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. 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): Tabot, Amy (University of Bradford)

Abstract format: Poster

Based on research from Lodzmia lakóvéle (2015), this poster wishes to suggest that the temporary circular mammoth bone “Ye-ranga” or “tipi” structures as found across Central Europe and the Russian Plain in the Upper Palaeolithic may be in fact be centres for childbirth.

lakóvéle (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 Stiffer (1988), Pidoplichko et al (1998) and Svboda (2003) has based discussion around easy to build structures that are raised around the larger mammoth bone structures. Upon separate research (Tabot 2019) regarding the Central European Venus figurines, a correlation was observed where the figurines where often found in areas where the tipi or Ye-ranga 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 Marxist methodology of interpreting the sites holistically along side 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-WESTERN BLUE HORIZON

Abstract author(s): Kucharik, Milan - Blažková, Tereza (Labrys o.p.s.)

Abstract format: Poster

The poster presents newly discovered prehistorical sites in North-East Bohemia, Czech Republic. Dry weather of last few years has revealed previously unknown prehistoric sites with circular ditches. We have discovered Late Neolithic circular ditch enclosure (rondel) in Hradec Králové - Hukleny 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 continous. 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 Děbalčík and Mízany (Hradec Králové district). These are probably ditches surrounding the foot of the burial mounds of the Bronze Age origin.

c. CIRCULAR PIT ALIGNMENT AT AN EARLY BRONZE AGE SETTLEMENT NEAR TO SZE Gordon (HU)

Abstract author(s): Szlaznai, Csaba (Hungarian National Museum / Magyar Nemzeti Múzeum)

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We discovered traces of a village with a loose structure dated to the Early Bronze Age Makó-Subasa, site. A number of circular pits were described in the late 19th and early 20th century by German and after World War II Polish archaeologists. Unfortunately, most of these sites were 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. 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.

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.
should such small objects bear in our reconstructions of the past?

3 IMPRESSING COMMUNITY: THE AGENCY OF MINIATURE SEAL IMAGERY TO CREATE AND EMBODY SOCIAL NETWORKS

Abstract author(s): Lengin-Hooper, Stephanie (Southern Methodist University)
Abstract format: Oral

Miniaturization is often equated with intimacy. Yet in the complex multicultural society of Hellenistic Babylon, in which miniature objects proliferated, pleasurable prospects of intimacy with tiny things were carefully cultivated. But miniatures were socially potent because they enabled complex 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/impresion binary, their permanent fragmentation indexing another object that existed elsewhere in the social environment. The miniaturised imagery on seals invited close looking, but when deployed as impressions across a Hellenistic Babylonian bulls 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, 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 Babylon. 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 re-creating them both across the miniature landscape of the city 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): Rapp, 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 blush-green glass jars could very well be made in the region but as yet no fact, the located factory in Pärnu County has not been discovered. This 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 we 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 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. From this point, more skilled workers were able to undertake complex tasks which were previously the province of masters. The increased demand for these objects has also been linked to increased trade and commerce.

6 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 reason for this attraction. It is 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 homogenous 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 requirement 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 Valenica-Casteljá (València, Spain). The ensemble includes a wide variety of artifacts (boxes, handles, combs, ...), a small number of elements 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 Valenica-Casteljá represented elements of its environment that were especially important for the group (for its economy and/or symbolic value) on a precarious and exiguous 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.

7 JUST ONE OF MANY: A SHAPED WOODEN PALISADE PLANK FROM THE LATE NEO-LITHIC

Abstract author(s): Kovács, Joseph (Eötvös archéologia, Terrascope Thin Section Services) - Ferrier, Antoine (Département de l'Aisne) - Poirier, Sandy - Raey, Delphine (Eötvös archéologie) - Tegel, Willy (Université Freiburg/Dendronet)
Abstract format: Oral

The Neolithic palisade at La Villeneuve-au-Chatelait, France was comprised of on the order of 50,000 or more oak timber planks, of which 2146-128 is typical. While not small – plank 2146-128 measures around 65 cm wide, around 20 cm 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 expanded. 3229 BC – who cut the likely thousands of trees, from which one of 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 travelling craftspersons who specialized in the construction of palisades? How many people, and from where, participated in enlisting 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 acorns and trees were not just resources to be exploited, but were organized and managed. Finally, the plank, like the site of La Villeneuve-au-Chatelait itself, is just one of many.

8 BADGES OF IDENTITY; JEWELS FROM THE TOMBS OF EARLY VASA QUEENS

Abstract author(s): González, 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 jewel 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 Lojenhuvud (d. 1551), wife of King Gustav Vasa, and Katariina Jagellonica (d. 1568), wife of King Johann III. Close examination of these jewels has provided strong evidence that these objects were worn during the lifetime of the women who 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.

9 A SHINY BROOCH AND ITS SECRETS

Abstract author(s): Pederesen, Inni (University of Oslo) - Kristoffersen, Eina (Universitetet i Stavanger)
Abstract format: Oral

This paper demonstrates 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 communica
tion they had with their contemporaries. The conclusions are based on a study of an elaborate brooch from the 6th century AD, an object that expresses a complex symbolic language through an intricate and demanding crafting process 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.
ARCHAEOLOGICAL ROUTES - NEW OPPORTUNITIES TO EXPLORE HERITAGE

Abstract author(s): Byczewska, 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 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 passive recipients of information. They can plan their visit or any means of transport (bike, 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 need of protection of archaeological heritage while having a direct access to it.

FROM AN EU-PROJECT TO A CULTURAL ROUTE - A STONEY WAY

Abstract author(s): Mole, 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 23 partners and associated partners from 6 countries in the Danube region in their pursuit for research, protection and presentation of Iron Age landscapes. 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 operate such transnational touristic routes. 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, Ezszt (Freie Universität Berlin; Eötvös Loránd University FH IAS) - Czifra, Szabolcs (Hungarian National Museum DHHP; Nové sedlo; Nové sedlo; University FH IAS) - Czifra, Szabolcs (Hungarian National Museum DHHP; Nové sedlo; Nové sedlo; University FH IAS) - Fábián, Szilvia (Hungarian National Museum DHHP; 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. Recognising 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 major 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 in Hungary. Besides the project-related sites (Sárdió, microregion, which is 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, which gravitate to Esztergom, there is still a great potential in heritage-based tourism development. The paper summarises 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

IN VINO VERITAS: HERITAGE ROUTES AND THE SPATIAL NARRATIVES OF VITICULTURE AND CIVILISATION

Abstract authors: (a) Hanssam, Emily - Wither, Robert (Durham University)

Abstract format: Orb

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 meanings of engaging sensually with the past, for example, through taste. In recent years, a number of wine-themed trails and routes have been developed in Europe, intervening landscape, archaeology, gastronomy and viticulture 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 vines 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 civilization and ancestor, and embody global/local tensions in their ancient and modernities and identities. We consider how transnational routes, in particular, serve to define spatial narratives that reflect temporal, seasonal 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 Silvram, Sarmizegetusa and Histria, and experienced via shared cultural tastes, such as wine drinking.

7

CHALLENGING PUBLIC PERCEPTIONS ON UPLAND LANDSCAPES IN BABIA (LEÓN, SPAIN): THE DISSEMINATION OF ARCHAEOLOGICAL RESEARCH THROUGH HIKING ROUTES

Abstract authors: (a) Gonzalez Alvarez, David (Institute of Heritage Sciences - Inspec, Spanish National Research Council - CSIC)

Abstract format: Orb

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 environments 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 imaginations and narratives disseminated by different stakeholders still tend to 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 unproblematised 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.

8

WALKING AND STUMBLING ON THE PATHS OF HERITAGE-MAKING FOR RURAL DEVELOPMENT IN THE ARICA HIGHLANDS

Abstract authors: (a) Saintany, Thibaut (Inspec-CSIC)

Abstract format: Orb

To reflect on the potential of the Cultural Route heritage category as an instrument for cultural revitalisation and community strengthening in highland regions, we analyse 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 so-called ‘I want to believe’ exhibition that has recently been displayed in the National Museum for Transylvania in Cluj-Napoca. It sums up the research history of the tablets from Tărtăria and further finds of round drug 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 belief. 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, etc.

9

ARCHEOBALT – LAUGHING FIXED FOUNDATIONS FOR INNOVATIVE ARCHAEO TOURISM - A NEW “GREEN” ARCHAEROUITE IN THE SOUTHERN BALTIC SEA REGION

Abstract authors: (a) Czontok, Karolina (University of Gdańsk; Archaeological Museum in Gdańsk) - Świątkowski, Bartosz (University of Gdańsk)

Abstract format: Oral

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.

The ArcheoBalt is a three-year project implemented by the University of Gdańsk, University of Aarhus, University of Lund, Museum of Bornholm and Museum of Malmö.

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. Creating archearoute “Place of power and rituals” links such unique archaeological sites like Sørla Moid, Smerenögdal (Bornholm, Denmark), Uppläkta (Lund, Sweden), Wisłoujście Fortress (Gdańsk, Poland), Stronghold in Özdve (Strongord, Poland), via cultural educational activities and events.

10

SIGNS AND SYMBOLS OF JERUSALEM ALONG MEDITERRANEAN PILGRIM'S ROUTES: FROM ARCHAEOLOGICAL TO VALORIZATION

Abstract authors: (a) Salvareni, Renata (European University of Rome; International Association for History of Religions)

Abstract format: Oral

The image 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. 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 servicenumine and to a larger World. 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.

Today, the International Definition of Heritage recognizes the processes of building of religious ideas and cultural landscapes. In an contemporary society can symbols, buildings and material structures emerging along historical routes can contribute to clarify cultural and identity general processes?

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 Rormea, Via Germanica). Cultural 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. Some specific artifacts and architectures (such as hostels and xenodochia, representations of Jerusalem, images of saints and pilgrims, etc.) will be analyzed as well.

Historical religious pathways will be assumed both as an interpretative key to understand general cultural transformation involving the whole society and as occasions to foster valorization actions based on archaeological heritage.
1 MATERIALIZED SIGNS AND SEMIOTIC SYSTEMS IN THE NEOLITHIC? EVIDENCE FROM GREECE

**Abstract author(s):** Maragou, 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, “loudsies”, “zar-studs”, rings, tablets, or tablets - some of which bearing incised marks or notches; and utilitarian or symbolic artefacts, such as spindle whorls or miniature vessels, 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 notation, 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 and/or 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 focusses mainly on so-called tokens and further, enigmatic clay objects from sites in the north-western peninsular 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 apotropically receive a mere religious connotation. But due to their find contexts, whereupon the clay tokens are associated with tall sticks, clay beads (plini/ xmnflu), large quantities of bones and broken zoomorphic miniatures, it seems plausible to regard them as memory devices. Especially the impressed notches on the broken tall sticks imply that those objects shall be contextualized in a sphere of counting or registering, as can be assumed as well on the basis of a wide range of specific objects 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, how far we can trace exchange of goods and at which dimension these exchange networks use the same symbols with the same meaning.”

3 MEDIEVAL MARKET ARCHAEOLOGIES: METHODS, CASES AND CONCEPTS

**Theme:** 2. 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.”

531 FROM BEACH TO HARBOUR MARKETS: ARENAS OF TRADE PRIOR TO MARKET SQUARES

**Abstract author(s):** Kolbing, Sven (Centre for Baltic and Scandinavian Archaeology)

**Abstract format:** Oral

“In the Scandinavian Sarssease 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 Finn, 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 through the year; a step which cannot be underestimated since market trade otherwise was mainly connected to fairs at things-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 affair as a result of their displacement tonnage. Former beach markets at landing sites thus had to make way for proper harbour facilities. As the case-study Hedeby illustrates, the beach markets were relocated into 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 for 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 marketplace 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 merchant towns of 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 the economic sense. Geoarchaeological research shows the complexity of the deposits anterior to the embalmed 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.”
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.

PLACES ASSOCIATED WITH TRADE AND EXCHANGE IN PRE-CENTURY AREAS OF SILESIA (POLISH LANDS)

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 21st century in Silesia (Polish lands). An attempt will be made to answer the question which indicators of material
culture are used to locate markets and other places of exchange. Attention will be drawn to the relationship between finds relat-
ed 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 fort-
ified areas is indicated by written sources and also conditioned by organizational nature (light 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 19th century.

THE MICROROMORPHOLOGY OF MARKETS

Abstract author(s): Vouters, Barbara (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 am-
blematic 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 com-
mon in the study of towns in the Low Countries and Scandinavia, important regions for (early) medieval urbanisation. This talk pre-
sents a number of case studies to illustrate different concepts of how market places evolved, and of what a market might have been, or could be.

9 FROM PIT HOUSE TO OPEN SPACE. THE MARKETPLACES OF HALBERSTADT

Abstract author(s): Schioch, 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 en-
semble (consisting of two marketplaces and a town hall). In the west there was the so-called wood market (12/76 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 holes) can be found under the later open spac-
es of both marketplaces. Here we grasp a transformation process in which a formerly populated area in the middle of the city was
remoulded into a temporary 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.

THE DEVELOPMENT OF THE MARKETPLACE AT PÁPA (HUNGARY)

Abstract author(s): Mordvinov, Maxim (Eötvös Loránd University, Institute of Archaeological Sciences) - Koláth, 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 al-
most 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 12th-13th-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 and the beginning of the 14th century. The market of the already urban settlement was transformed significantly more two 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 became 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 place took after a heavy siege in the late 14th century.

The MEVAL MARKETPLACE OF TENDAL (MARCH OF BRANDENBURG) AND ONE OF THE OLDEST MARKETS NORTH OF THE ALPS

Abstract author(s): Feike, Timo · Böhme, Manfred (University of Halle)

Abstract format: Poster

Tendal was the first market founded after the Magdeburg law 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 Tendal 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 Tendal can be stated as the biggest and wealthiest town of the March of Brandenburg measuring more than 90 hectares.

Due to the good conservation of the town compared to other cities like Magdeburg archaeological activities and excavations wasn’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 shows us details of trade but also of production.

Therefore, the marketplace of Tendal 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: S. 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 institutions on social media, blogs, 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 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—You Tube, virtual exhibitions, Instagram, Twitter, etc.—but engaging with the public has moved beyond the professional context. For several years, non-specialists “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.

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 most successful and enduring efforts have included the AIA 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 cemetry project—to anchor a discussion of AIA’s electronic resources, their creation and distribution, and their impact. In particular 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, Aurelia (ArchaeoConcept, ArcheoTourism)

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 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 2016, 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 (ArcheoPublica)

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 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.
OF OUR BEST, FINDING COMMON GROUND: ARCHAEOLOGICAL STANDARDS THAT TRANSCEND NATIONAL PRACTICE (PAA)

A CROSS-DISCIPLINARY APPROACH TO DISSEMINATE ARCHAEOLOGY ONLINE

LIKE AND SUBSCRIBE: DIG IT WITH RAVEN AND THE DEMOCRATIZATION OF ARCHAEOLOGICAL EDUCATION THROUGH YOUTUBE AND SOCIAL MEDIA

FROM ANCIENT CORINTH TO EVERY CORNER OF THE WORLD: SKYPE IN THE CLASSROOM AND THE ROLE OF ONLINE EDUCATION
**1 TRANSCENDENT ETHICS: ARCHAEOLOGISTS VALUING, ETHICAL PRACTICE AND STANDARDS**

**Abstract author(s):** Vail, Gerald (GWHeritage DU)

**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 ways - important - ways based on the ethics of archæological practice and that ethical codes are in many ways much 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 basic standards for the details of archæological practice.

- **THE STANDARDS OF ITALIAN PUBLIC ARCHEOLOGY BETWEEN REGULATIONS, HYPERSPECIALISM AND FUTURE PROFESSION**

**Abstract author(s):** La Serra, Cristiana - Giorgio, Marcello - Carbone, Oriana - Garini, Alessandro (ANAP)

**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, archæological institutions and professionals of each country. The standards used in Italy, edited by ICOMO, 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 archæological 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 other countries. Therefore, it is necessary to overcome this internal limit. In Italy, as is the case in for instance The Netherlands, Poland and the Czech Republic -, by advocating for heritage to advance a range of archæology activities, for instance those of CIfA. The Faro Convention challenges the limitations of commercially defined standards re-defined to meet changing conditions. In many countries, systems are designed for commercial practice and relate to field re-

- **SHOULD COMMUNITY ARCHAEOLOGY PRACTICE INFLUENCE PROFESSIONAL QUALITY PROFESSIONAL?**

**Abstract author(s):** Van Londen, Heleen (University of Amsterdam) - Lewis, Careenza (Lincoln University) - Marciniak, Arka dus (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 re-

- **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 this 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 archæological best practice. We require standards that are forward thinking, but which also must apply to a landscape occupied by dual shared archæological jurisdictions which are unified by their shared profession. 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 archæological institutions?
- Do they serve to challenge or to reinforce power relations?
- How might we find common ground to improve the practice of archæology?

- **SHARED PAST, SHARED ETHICS, BUT DIFFERENT STANDARDS: THE MECHANISMS BEHIND OUR NATIONAL STANDARDS AND WHY THEY MIGHT BE HARD TO OVERCOME**

**Abstract author(s):** Hessing, 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 archæological 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 archæologist, 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 archæological results. Although there is professional common ground and there are even some international rules and regulations, national archæological 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 archæological research and cooperation between professionals in large-scale international infra-

**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 archæological 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 archæological 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.

TOWARDS AN ARCHAEOLOGY OF PARTISAN AND RESISTANCE NETWORKS AND LANDSCAPES IN 20TH-CENTURY EUROPE

Theme: 2. Networks, networking, communication: archaeology of interactions
Organisers: Symonds, James (University of Amsterdam) - Vareka, Pavl (University of West Bohemia)
Format: Regular session

Resistance to occupying forces and state repression took many forms in 20th-century Europe, from covert networks serving to conceal or assist the escape of vulnerable individuals or families, to guerilla 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 multiscalar 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?


LIVING IN THE CITY OF THE FOREST: THE ARCHAEOLOGY OF LIFESTYLES OF THE NORTHERN IBERIA GUERRILLA MOVEMENT

Abstract author(s): Tejerizo, Carlos (Universidade do Pais Vasco) - Rodriguez, Alejandro (Universidade de Santiago de Compostela) - Romero, Antonio (Universidade do Pais 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 Franquiste 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 Casaac (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 evidence material we have delved into the complexities of the guerilla warfare and the quotidian life of those guerrilleros who lived in the camp. 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 relationships, 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.

The battlefields of the Lithuanian Partisan War (1944-1945) 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.

ARCHAEOLOGY OF THE “MISTR JAN HUS” PARTISAN BRIGADE IN THE OCCUPIED CZECHOSLOVAKIA (1944-1945)

Abstract author(s): Vareka, Pavl (University of West Bohemia) - Symonds, James (Amsterdam University)
Abstract format: Oral

In the autumn of 1944, 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 Držnička, a village in central Croatia. In this paper, we will present and discuss the project “Heritage from Below. Držnička: Trees and Memories 1941-1947.” This interdisciplinary project aims at locating and documenting partisan sites, monuments and memorial areas of the wider Držnička 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, geodetic, architectural surveys, as well as archaeological work. The research project is being carried out in collaboration with the community of Držnička, 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 Držnička region based on historical cartography and oral history. Based on this survey, we will examine the patterns of distribution of the camps and shelters in the region and compare them with the post-war memorialization plans.

ABSTRACTS

1. LIVING IN THE CITY OF THE FOREST: THE ARCHAEOLOGY OF LIFESTYLES OF THE NORTHERN IBERIA GUERRILLA MOVEMENT

Abstract author(s): Tejerizo, Carlos (Universidade do Pais Vasco) - Rodriguez, Alejandro (Universidade de Santiago de Compostela) - Romero, Antonio (Universidade do Pais Vasco)
Abstract format: Oral

2. DŘEŽNICA: AN ARCHAEOLOGY OF RESISTANCE IN WW2 YUGOSLAVIA

Abstract author(s): Gomes Coelho, Rui (UNIARQ-Center for Archaeology, University of Lisbon) - Aydin Vila, Xuxu (Instituto de Contemporary History, New University of Lisbon) - Horvatíndíl, Sanja (Instituto de Art History, Zagreb)
Abstract format: Oral

3. CAMP SITES, PILLOW BOXES AND DUGOUTS AS HIDING PLACES FOR “FOREST GUARD” – FINNISH DEFENDERS AND RESISTANCE MOVEMENTS OF CONTINUATION WARS 1941-1944

Abstract author(s): Kauhanen, Riku (University of Turku, Department of Archaeology)
Abstract format: Oral

4. BATTLEFIELDS OF THE LITHUANIAN PARTISAN WAR: A COMPLEX APPROACH

Abstract author(s): Petrukasas, Gediminas (National Museum of Lithuania; Klaipėda University, Institute of Baltic Region History and Archaeology)
Abstract format: Oral

5. ARCHAEOLGY OF THE “MISTR JAN HUS” PARTISAN BRIGADE IN THE OCCUPIED CZECHOSLOVAKIA (1944-1945)

Abstract author(s): Vareka, Pavl (University of West Bohemia) - Symonds, James (Amsterdam University)
Abstract format: Oral
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 1946. The 12-member group of specially trained Red Army soldiers soon expanded to including Polish, Soviet, Greek PWK and Czech forces 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 ARCHAEOLOGY OF CHARTER 77

Abstract author(s): Vankov, Zdenka (University of West Bohemia)

Abstract format: Oral

The dynamics 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 analysing 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 commemorating and celebrating the Soviet-led 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.

PERSONAL FREEDOM IN THE TOTALITARIANISM OF THE 20TH CENTURY IN THE PRISM OF PHYSICAL ANTHROPOLOGY AND ARCHAEOLOGY

Abstract author(s): Konczowska, Paweł (Wroclaw University of Environmental and Life Sciences, Department of Anthropology)

Abstract format: Oral

The typically material evidence of partisan activities in East Bohemia, but also in other parts of the country, are so-called “bunkers” (burken 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 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.

GLASS BECOMES COMMODITY: MIGRANT WORKERS IN 17TH AND 18TH CENTURY ESTONIA

Abstract author(s): Rappo, 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 silica, 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.

FINDS OF LATE MEDIEVAL AND EARLY POST-MEDIEVAL CLOTH SEALS IN SERBIA

Abstract author(s): Ramadanski, Rasiko (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 scholars; 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): Escorbono-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 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 processes 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): Jelavic, 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 lifespan. The forms of the bowls and signs changed quickly and were therefore easily and relatively precisely datable, usually to 20-30 years precisely. The famous economic historian Jan van Veen van de Wouw 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 (Veen, 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 modern archaeological sites, the tobacco pipes and their fragments. Even after 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 smoking 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 is as 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): Dumka, Pawel (Institute of Archaeology University of Wroclaw)
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 several centuries. While the importance of this plant in economic history is often overemphasised, 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 excavation sites also saving 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 analysis 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 status 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 memorials can be seen to have agency within the burial ground and where they are 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 memorials 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 (SZCZUCZYŃ – POLAND)

Abstract author(s): Grupa, Małgorzata - 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 crypt under the presbytery of the church of The Name of The Holy Virgin Mary in Szczuczyn enabled us to conduct a wide range interpretation of the grave goods on mumified human remains, as well as an exact identification of some of the deceased. The presumed remains of the church founder: Stanisław Antoni Szczuka and his son Marcini were carefully anthropologically examined unfortunately in situ, what due to the fact of partial body mumification, 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. DNA confirmed our hypothesis of both individuals was observed examined detailed skulls. 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, Marcini 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 pattern to modern dressing gown, and 1.89 h. known in Poland as ’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, AD1360-1850

Abstract author(s): Orstavik, Eugenius (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 experience 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-c.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).

ARTISAN AGENCY AND ENDURANCE OF COMMON WARE PRODUCTION: BUILDING POST-MEDIEVAL ECONOMY AND IDENTITY THROUGH PEOPLE-POTTERY ENTANGLEMENT

Abstract author(s): Trzeciak, Esther (Universitat de Barcelona) - Vicenc Tarrés, Joan (Museu de la Terrissa de Quer)
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 medival rural sites [1]. Although greyware production experienced a deep crisis at the dawn of Modern Age, it had a very persistent tradition with some pottaries lasting until the late twentieth century. Those who did rethink the product and update its final features to new and changing 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 experience 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-c.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).

The town of Quart (Catalonia, Spain) is one of these. Greyware production still active at this site became not only the first economic industrial mining district (Bergslagen).

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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 1672 May 7th, the history of artisan agency and pottery production in Quarr 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 artifacts 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 visual shape analyses and experimental archaeology to understand diachronically how communities build their identities and traditions.


325 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: Range, Mads (Odense City Museums) - Torell, 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 ideas on how to meet this challenge. Submissions could focus on how to make the non-visible cultural heritage visible in front of 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): Range, Mads - Mogensen, Mette (Odense City Museums)

Abstract format: Oral

In Denmark over the last decades a growing number of developer paid 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 prehistoric 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 anchor 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 pride 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 - Sovemen, Kilican (REGIO Cultural Heritage Consultancy)

Abstract format: Oral

In the last decades, many large scale infrastructure projects such as Tanoğlu Natural Pipeline Project, North Marmara Highway Project, Ankara-Nigde 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 ESA (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 ESA 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 best 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, Charlotte (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 runestone mentions that Harald, king of the Danes in the mid 10th century ‘won all Denmark and Norway and Christianed 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 runestone 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 runestone stones and a church situated between the burial mounds. Additional research excavations carried out between 2006 and 2015 with the National Museum and Aarhus University revealed under the top soil among others, a huge palisade, which encircled the area – three Vikings houses of Tollund 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 success stories, 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 (Danish Funen Museum)

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 10,000 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 rule-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): Krapala, 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 purpos-
as 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 Cedergren 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 pedagogy, archaeologists, role-playing 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 Iron Age. The Kokemäki-river area was 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. The game showed promise as a platform for bringing Iron Age prehistory to the classroom. This presentation provides a first look at the implementation of the game into the classroom, directions for future game development, and the pros and cons of using Minecraft for prehistory education and as a learning platform for sustainable cultural heritage education.

6 PLAY YOUR WAY TO KNOWLEDGE OF THE PAST – A (EXCAVATED) 16TH-CENTURY CITY DOES DIGITAL

Abstract author(s): Azaporaj, Amandassa; Bakunin Fröden, Mila (Röj Göteborg Natur och Kulturkooperativa)

Abstract format: Oral

Once upon a time, under today’s high buildings, the tram tracks and train station lay a city called Nya Löttis. 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 was war 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 1479-1624 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 local media and through the site visits. The excavation is now finalised 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 Löttis 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 Löttis in the attempt of making 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.

The cultural landscape consists of places and monuments enriched with history, stories and myths, both tangible and intangible, and didactics approaches intended to last over a longer period of time.

In this presentation, with the example of the Iron Age project in the coastal region of Sweden, I want to focus on the importance of participation in both the project and the translation to a sustainable outcome and strategy. Working with multiple stakeholders, meaning the site owners, the county administrative departments, the developers and the public, we have to find ways to create meaningful models and strategies that enable long-term strategies for dissemination of archaeological results. Those could be defined in the specifications from the county administrative boards as well as the archaeological companies’ communication plans, and maybe already in the evaluation phase for a better long-term planning.

8 THE PAST EXPOSED – DISSEMINATING ARCHAEOLOGICAL RESEARCH FROM THE INSIDE OF A MOBILE CONTAINER

Abstract author(s): Dahlström, Hanna - Jansen, Jana (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, we have been working 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 major 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 major 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 as well as 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 (Baltfyns Museer)

Abstract format: Oral

With an art installation made of water and light, a Viking Ghost Ship appeared at the cultural landscape of Korting 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): Torell, 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, the Bohuslän museums 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 we 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 TÖ—the Swedish accessibility
sheep in the Lower Volga Region, so these are domestic sheep. However, it is evident that the population of Pre-Caspian 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. Polynography indicates a warm and humid climate. The udder size of sheep increases at the Khvalynsk sites Kaya-Kuduk and Karashiv 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 bring to light the development of an economy based on dairy production. 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 Amisolithic-Aurignacian in the Khvalynsk culture sites. These signs of domestication of the aurochs by the Khvalynsk culture are thus, in the process by which domesticated cattle appear in the Lower Volga Region (the Balkans or Caucasus) remains an open question.

326 THE COMPLEXITY OF NEOLITHIC LIVESTOCK MANAGEMENT, DAIRY PRODUCTION, AND FARMING STRATEGIES NORTH OF THE ALPS

6. Strategies and methods in archaeology: interactions between disciplines

Organisers: Philippesen, Bente (National Museum of Denmark; Aarhus AMS Centre) - Gron, Kurt (Durham University) - Macinich, Arpad (Adam Mickiewicz University Poznań) - Sørensen, Lasse (National Museum of Denmark)

Format: Regular session

Recent years have seen an increasing number of studies of early cattle-based agricultural production, mostly through zoosarchaeology, isotope methods, and ceramic residue analysis. Results have shown that in some regions, dairying was adopted much later than cattle breeding, and in some areas at all. In other regions, dairying appears to have been practised from the introduction of domestic stock. This variability underscores the diversification of Neolithic farming practices 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 communities is of great interest. Specialist knowledge and skills were needed to ensure ongoing productivity, especially if dairying was involved, and to maximise 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.

1 THE SPECIFICS OF THE EMERGENCE OF DAIRY HUSBANDRY EMERGENCE IN THE LOWER VOLGA REGION

Abstract author(s): Doga, Natalia (-) - Vilomov, 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 4500 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 database—to ensure that the cultural heritage places are described sufficiently well to make it easy for people with disabilities to plan visits to Boholinska 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) - Marciniak, Kurt (Durham University) - Gron, Kurt (Durham University)

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 to promote the 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 Walking is a long-distance hiking route, part of EP, along the Baltic Sea coast. The route includes more than 600 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 integrating the 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 to disseminate underwater archaeological sites in a new, innovative way and making the invisible visible?
tured while affording 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 animals. This is not due to 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 analysis 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 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 dairy 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 differing pattern, and organic residue analysis on pottery has confirmed the presence of the 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.

327 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, Annemiek (Independent researcher) - Rainio, Riitta (Academy of Finland research fellow, Department of Cultures, University of Helsinki) - Mannermaa, Kristina (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 instrument 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 aims 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 ACITUS’ EAGLE BONE AND OTHER WIND INSTRUMENT CANDIDATES FROM A ROMAN FORT IN THE NETHERLANDS

Abstract author(s): Tamboer, Annemiek (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 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, Acitus, is scratched on, witness that is not left out but a flute made out of bone with an intact joint producing sound by being blown on the rim are known from the ethnocosmological record. A replica of the “Acitus” bone when blown this way does sound in- deed. 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.

SOUND INSTRUMENTS OR NOT – THAT’S THE QUESTION! ABOUT ARCHAEOLOGICAL FINDS IN SCANDINAVIA OF TUBULAR BONE OBJECTS

Abstract author(s): Storbek 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 primary 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.

POLISH BONE PIPES AND TUBES

Abstract author(s): Papińska, 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 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 needled cases, but there are some interpretations that they are decays. 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 decays or signaling tools. Studying the musical functions of such pipes and tubes made from bones is one of the most purposes of the presentation.

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 categorized, 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 read 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 blown flutes or read 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.
6 ENOMIATIC TUBULAR BONES AS SOUND INSTRUMENTS IN THE EARLY MEDIEVAL CENTRES OF SLAVS IN POLAND
Abstract author(s): Kowalika, Milena - Malaniewski, Daniel (Institute of Archaeology, 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 wastebasket 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): Mannneraara, Kristiina (University of Helsinki / University of Tartu) - Rainio, Ritta-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 Yuzhny Ulonost (Ostrow Onaga, 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 humanity or- ganized societies 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 the context of this tradition, finds of bone flutes from the Neolithic sites of Dubokraj and Chornaya Gora in Russia are of interest. Their tonometric characteristics are examined for comparison with bone flutes from other regions of Europe. The only organological investigation of tubular bone flutes was carried out in the mid-1980s by Felix Raudek, who in his book “Instrument-maker, and a historically informed performer of Baroque music. In his study of two open single and blown Neolithic bone flutes with finger holes (421.111.12) from Dubokraj lalai (Russia) he criticized C. Bradé’s approach for organological mistakes. He provided the morphological description of original finds but for tonometrics (due to the fragile state of preservation) he used copies based on metric measurements and X-ray analysis of artifacts. In his interpretation the scales of these Neolithic flutes belong to third tone system.

9 CELTIBERIAN PERFORATED BONES IN THE NUMANTINE MUSEUM OF SORIA (SPAIN)
Abstract author(s): Jiménez Passalodos, 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 Prehistoria (May - November 2018) and displayed as possible tools. The first example is an animal bone with three seemingly finger holes, found at the Celtiberian Roman city of Tartesios (Soria) and dated to the 1st Century B.C. or 1st Century A.D. The other two examples are a pair of small perforated bone flutes, found at the Celtiberian-Roman city of Numantia, and dated also to the 1st Century B.C. or the 1st Century A.D. This last two objects show similarities with other archaeological and ethnoarchaeological 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 ethnoarchaeological parallels.

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, Ritty (Florida Museum of Natural History, University of Florida) - Boldo, Ariane (Florida Museum of Natural History, University of Florida) - Powis, Terry (Department of Geography and Anthropology, Kennesaw State University) - Stanchly, N (American University in Beirut) - Noort, Arij (Ariane) (Florida Museum of Natural History, University of Florida)  
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 test the bone. 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 test the bone. 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 test the bone. 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 test the bone. 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 test the bone.
Corded Ware Culture’s Bone Tube as an Aerophone: Case Study from SE Poland

Abstract author(s): Hakusze, Agata (Institute of Archaeology, University of Wrocław, Poland; Archeologia Foundation) – Tokarczuk, Dominika (Department of Ethnology and Cultural Anthropology, University of Wrocław, Poland) – Mackiewicz, Maksym (Polish Centre of Mediterranean Archaeology, University of Warsaw, Poland; Archeologia 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 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 style: smoothing, bevelling of the edges and appearing of notches on the end.

The subject of our study was an artifact discovered at the Szczepawice site, Lesser Poland. The object in the form of a short bone tube was found in the Corded Ware Culture community’s multi-individual niche grave, next to the skeletal remains of a mature male. The trassological as well as taphonomic study and broader context of similar finds allow us to interpret this tube as a musical instrument.

The research was conducted within the National Science Centre, Poland, project no. UMO-2018/29/N/H30/00897.

Abstract format: Oral

A Multidisciplinary Assessment of Population Dynamics across Upper Palaeolithic to Bronze Age Siberia

Abstract author(s): Yu, He – Syrova, Maria (Department of Archaeoarheogenetics, Max Planck Institute for the Science of Human History, Jena; Institute for the Science of Human History, Jena; Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences) – Buzhilova, Alexandra (Research Institute and Museum of Anthropology, Moscow State University; Institute of Archaeology, Russian Academy of Sciences) – Jeong, Choongwon (Department of Archaeoarheogenetics, Max Planck Institute for the Science of Human History, Jena) – Karapetian, Marina (Research Institute and Museum of Anthropology, Moscow State University; Institute of Archaeology, Russian Academy of Sciences) – LeRoux, Petrus (Department of Geological Sciences, University of Cape Town) – Roberts, Patrick (Department of Archaeology, University of Cape Town) – Pavlenok, Galina (Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences) – Volotova, Maria (Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences)

Abstract format: Oral

The systematic accumulation of human remains from both Paleolithic and Neolithic contexts across the region provides a unique opportunity to study the population dynamics over the region. By applying genomic, taphonomic, and archaeological data we can shed light on the migration processes and the cultural interactions during the period.

Abstract format: Oral

Population Dynamics and Ecological Influences in European Hunter-Gatherers (PAM)

Theme: 6. Theories and methods in archaeology: Interactions between disciplines

Organisers: Posth, Cosimo (Department of Archaeoarheogenetics, Max Planck Institute for the Science of Human History, Jena; Institute for the Science of Human History, Jena; Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences) – Syrova, Maria (Department of Archaeoarheogenetics, 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. However, we lack a sufficiently nuanced understanding of the human past. This session will focus on examples of interdisciplinary research which led to new insights on the population history of European hunter-gatherers from the Upper Paleolithic 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 Mesolithic 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 archaeoarchaeogenetics, osteoarchaeology and stable isotopes. In addition, we wish to enrich our understanding of hunter-gatherer ecology through contributions from the fields of molecular and skeletal paleopathology. 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 methodological tools are integrated to bring forward bioarchaeological research.
everyday life of local hunters-gatherers and fishermen.

Grant of IFRF 17-29-04125.

5 DID TUBERCULOSIS EXIST IN EUROPE AT LATE UPPER PALEOLITHIC? PALEOMAGING 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) - Pfiff, György (Department of Anthopology, University of Szeged) - Gily, Bernard (DNM, 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 Ibsouliers, near Montlimar (France), Azilian burials have been discovered and dated to 12010 ± 80 BP (Daly & Morand, 1998). Human remains were associated with rich archaeological material (D'Errico & Vanhaeren, 2002) as well as abundant remains of wild fauna (Chia, 2000). Human remains represent at least 4 adult males and 6 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 paleomaging, the remains presenting lesions suggesting tuberculosis. Two specimens are analysed: a sacroiliac osteoarthrosis and a femoral lesion evolving osteomyelits 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 nomadic Neolithic populations (Poliakov, 1998) which were not yet practicing domestication (Baker & al, 2015).


6 BETWEEN HUNTER-GATHERERS AND PRODUCERS: TREPANATIONS IN THE ENEOLITHIC PERIOD IN THE NORTH CAUCASUS

**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-gatherers” includes many lifestyle options as well. One of the important aspects of lifestyle studies is the reconstruction of mobility patterns. A set of hard evidence, such as 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 particular. 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 (Storozh, Hamkova, 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 Mesolithic and Neolithic periods (PPNB) which were not yet practicing domestication (Baker & al, 2015).


7 EXPERIENCING NETWORKS: PRACTICES OF TRADE AND VALUE ASSESSMENT THROUGH TIME AND SPACE

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

**Organisers:** Poignant, Thibaud (Univ. Bordeaux Montaigne - UMR 5607 Ausonius; Univ. Toulouse Jean Jaurès - UMR 5608 TRACES) - Gorgues, Alexis (Univ. Bordeaux Montaigne - UMR 5607 Ausonius) - Milheim, Lena (Museum of Cultural History University of Oslo, Dept. of Archaeology, Conservation and History, University of Oslo)

**Abstract 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 value assessment (Majewski 2013) and the reasons and consequences of value destruction in the ancient world (Barcelonina 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 far – 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 communissable. 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 consistent.

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 archiologcal 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.

**ABSTRACTS**

1 A SMALL CREDIT REVOLUTION? TESTING THE MONEY-HYPOTHESIS ON COMPLETE AND FRAGMENTED OBJECTS IN EUROPEAN BRONZE AGE HOARDS

**Abstract author(s):** Ialong, 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-literary 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-literary 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 expectations if they were used as money, complete objects and fragments should comply with standard weight systems. The results indicate that bronze
Oral

Debels, Pauline (University Paul-Valéry Montpellier 3, UMR 5140 ASM; University Paris 1 Panthéon-Sorbonne, UMR 7041 Vepmo)
Poigt, Thibaud - Gorgues, Alexis (Univ. Bordeaux Montaigne - UMR 5607 Ausonius)

ing in detail how it was produced, transported, priced and exchanged. The analysis is based on seven years of research into available

This paper is to provide a glimpse into these old price regulations and traditions through the Icelandic rotary quernstone by dissect

erally measured in standards of fish or homespun cloth but in internal trade, general products were often exchanged for staples such

century, and were recorded in some detail as early as the mid-17th century. Product value in both internal and foreign trade was gen

In late-18th century Iceland a governmental decision was made to start importing unground grain and revive indigenous quernstone

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 manufacture and trade.

In this paper, we will present some of the main features of this analytical tool and some case studies about weight, volume and control

in Prehistory

trust in reputation and honour, on mutual experience. Interpersonal trust lays in the faith

The two extremes are what can be called interpersonal trust on the one hand and systemic trust on the other. Interpersonal trust is based on reputation and honour, on mutual experience. Interpersonal trust lays in the faith one has 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 anywhere we have material elements allowing for standard measurement (weighing, volume control, etc.) 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, Sóleig (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 localized. The local production was taken over 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 Baulög. They held fast for 700 years, from the 12th to the 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, raw materials 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 some of the main features of this analytical tool and some case studies about weight, volume and control in Late Prehistory.

340 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-Valléry Montpellier 3, UMR 5140 ASM; University Paris 1 Panthéon-Sorbonne, UMR 7041 Vepmo) - Jean, Mathilde (University Paris 1 Panthéon-Sorbonne, UMR 7041 Vepmo - Dalbeay, Thomas (University of Southern Denmark, Department of Physics, Chemistry and Pharmacy, CHART) - Delvoye, Adrien (University of Geneva, Department Genetic and Evolution, Anthropology, Fyssen 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 period time, 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-ope ratoire” of consuming potteries, this session wishes to discuss the life cycle of pottery, above the limits of academic fields. Following Braid’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 geochemi cal analysis may document the provenance of raw materials, of the ceramics, of the contexts, and, in particular, the processes of pottery production. Shapes and decoration styles are the basis of typological 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 particularistic. Beyond summarisation of recent advances in ceramic analysis, homogenisation of methodologies and vocabulary is now a key issue to make works comparable.

1 SAME SHAPE, SAME PROCESS, SAME POT? THE STANDARDIZATION PHENOMENON THROUGH THE EYES OF TECHNICAL STUDY

Abstract author(s): Verdelot, Cécile (CNRS - UMR7041 / Haro)

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 Cinarîte 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 this approach, we can study the evolution of the Late Neolithic in the broad sense and the many regional characteristics of this period in Europe. The aim was to compare the pottery from the different regions in order to understand the influence of regional and local traditions. The results showed that there were significant differences between the different regions, with some similarity in certain aspects. This approach provided a better understanding of the Late Neolithic period in Europe.

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 those from other sites, including Assur, thanks to the willingness of B. Holwing (Vorderasiatisches Museum, Berlin). Through macroscopic observations and identification of characteristic traces, we aim to bring to the light the specificities of local making-process.

Combining typological and technical analysis should enable us to identify variations in the technical process of a potter 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

Abstract author(s): Hostetler, Marco (Institute for Archaeological Sciences, University of Bern); - Chatenay, Marie (UMR 6298 ARTECH) - Stapfer, Regine (Archaeological Service of the Canton of Bern) - Emmenegger, Lu (Freelance) - Hafner, Albert (Institute for Archaeological Sciences, University of Bern)

Abstract format: Oral

The potteries are situated at the northern shore of the small lake Burgäschisee 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 potter type (e.g. Western Switzerland with the so-called Collardot 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 Burgäschisee, however in Burgäschisee-Nord (7000-3600 BC) all three pottery traditions are present. By combining petrographical analysis of the ceramics produced at the site, the petrographic composition of the raw materials was determined.

To conduct an in-depth study of these stylistic interrelationships a crossed-analysis was applied, combining stylistic, technological and petrographical methodologies.

The technological analysis, based on the reconstruction of the "chaînes opératoires", allows 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 from 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 Burgäschisee 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, Sjøgren 2018) takes place in Western and Central Europe in the middle of the third millennium 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 St. Van der Leauw in the Netherlands (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.

According to the variability inside the material culture, A. Galay divided the Beaker Complex in different networks (Galay 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" (Lumecier 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 comparative 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 results, as well as unexpected 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 or 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, patrography, and provenance analysis of ceramics.

5

IRON AGE POTTERY PRODUCTION IN THE PYRENEES: THE CASE OF STUDY OF BALTÄRGA, CERDANYA

Abstract author(s): Alliot, Pascal - Morera, Jordi - Oller, Joan - Olloqui, Oriol (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona)

Abstract format: Oral

Typological 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 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 typological analysis of handmade ceramics from the Late Iron Age occupations of Baltarga, in Belvàs de Cerdanya, spanning from the fourth century to the first century BC, where handmade pottery constitutes 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-standardised domestic production modes. Similarities with handmade potteries from southern Gaul were also noticed and further discussed.

This pioneering typological study in Baltarga represents a first step towards the standardisation 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): Sophia, Maré (CRINIS) - 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 interpretative 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 potteries and Umm an-Nar domestic pottery produced by Indus or Indo-Aryan influence, 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, Bart, and Amlah) and the eastern region of Abu Dhabi (Emirates).
7
CERAMIC ASSEMBLAGE OF NEOLITHIC SETTLEMENT WUTAI SHAN (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 Wutai Shan site, in Jilin province, North-East China. It provided a large Neolithic ceramographic assemblage from 8th 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 chine operation concept and analyzing petrographic samples.

Throughout the initial sorting phase four major groups have been defined through naked-eye observations of the ceramic pastes 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 shell inclusions pastes and added cords 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 techne-petrographic analysis. Preliminary results show that the Wutai Shan site contains a heterogeneous ceramic assemblage originating from at least four distinctive social group from different areas.

8
LKB 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 Late Bronze and Iron Age cultures 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 as valid without examining other possible hypotheses.

Study was conducted around a central question: Why were organic inclusions substituted by mineral and ceramic additives in the Middle and Late LBI 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 while re-examining processes of prehistoric pottery and the technological properties of different ceramic vessels determining the vessels’ 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 BERIAN DOLMEN: PRODUCTION, USE AND REJECT

Abstract author(s): Castro González, M. Guadalupe - Martínez Cortizas, Antonio (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 Guadino Avoedo site, 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 4500 BC to 850 BC, which includes diverse funerary and ceremonial uses.

This study, focuses on the reconstruction of the vessel’s “life” (their manufacture, use and reject), has two basic methodological blocks: one is based on the archaeological features of the potteries and another that is focused 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.

10
LIFE-CYCLE OF ANGOSTO CHICO INCISO VESSELS. DIFFERENT METHODS IN THE ANALYSIS OF A PARTICULAR STYLE FROM QUEBRADA DE HUMAHUACA (ARGENTINA)

Abstract author(s): Sivàn, Agnieszka (Institute of Archaeology - CONICET-UNLa)

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 used. Angosto Chico Inciso was considered one of the local late pre-Hispanic ceramic styles of Quebrada de Humahuaca (North of Argentina), although its foreign origin is documented 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 Quebrada de Huayca, Pucara de Volcán, and El Poblado 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.

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 refined 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 potter and the specific archaeological context can influence these results.

THERMOLUMINESCENCE DATING OF PRE-COLOMBIAN CERAMICS FROM THE US VIRGIN ISLANDS

Abstract author(s): Dobrow, 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 Olmec 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-defined and well-marked ceramic vessels with different decorative 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 Irvine Rouse during the second half of the 20th century. However, recent archaeological investigations in Caribbean area show that rather than a complex cultural and material pattern. The thermoluminescence dating of 160 ceramic samples from the Virgin Islands founded in 6 archaeological sites and curated by the National Museum of Denmark show results leading in this most recent direction. Even though these new dates generally fit with the classic typo-chrono, several striking examples of inadequacy are displayed and seem to confirm the presence of a dynamic interactions reflected by local and diachronic evolution of the ceramics in Caribbean islands.

POTTERY, LANGUAGE AND CULTURAL BASIN: A NEW MEANING IN A NEW CONTEXT

Abstract author(s): Novikova, Lucia (Tinava university in Tinava - Heidari, Ahmad (Islamic Azad University, Bijar 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 related to a particular region. Although cultural areas are useful in understanding the broader aspect of social life that goes beyond “the symbolic”, 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 used. Angosto Chico Inciso was considered one of the local late pre-Hispanic ceramic styles of Quebrada de Humahuaca (North of Argentina), although its foreign origin is documented 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 Quebrada de Huayca, Pucara de Volcán, and El Poblado 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.
One of the most annoying object types of processed pottery’s sherds is a characterless, unglazed soup bowl. A large number of techniques. In addition to traditional typological examinations, the large number of finds also made it possible to observe various manufacturing aspects for the expression of identity in these communities at a time of change.

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 context. Pottery in 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- cuted in Margat Castle (Q’alat– al-Marqab, Syria) since 2007. As a result of these extensive fieldwork, a large number of objects from the 8th century B.C., the settlement of Phoenician groups in Southeast Iberia had a marked effect on the Early Iron Age indigenous culture. Ceramics are a powerful tool to document these changes. The Syrian – Hungarian Archaeological Mission aims to connect scholars from numerous disciplinary perspectives to share research about the Székely people and have helped to embed the region’s history in a broader European context. The purpose of this session is to connect scholars from numerous disciplinary perspectives to share research about the Székelyföld through a multidisciplinary approach to the past.

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 paraibuna palatial residence. It could even be in relation to the vizir and polygraph Ibn al-İjāb. The dimensions of the water reservoir exceed strictly agricultural needs, giving it recreational and represent- ative functionality. From the 13th century there is a process of agropastoral phase, which will be consolidated during the Early Modern Period, when only the pool was used but not the building around. Being in the 11th 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. Evoking from a palata and power environment, to an agricultural and rural landscape.

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.

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 Albercón del Moro Archaeological Site (Granada, Spain) are 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 Syria were found on the castles or manor houses, whereas 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 topic 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 alteration 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 Opone Castle.

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 the Székely people and have helped to embed the region’s history in a broader European context. The purpose of this session is to connect scholars from numerous disciplinary perspectives to share research about the Székely people and have helped to embed the region’s history in a broader European context. The purpose of this session is to connect scholars from numerous disciplinary perspectives to share research about the Székely people and have helped to embed the region’s history in a broader European context. The purpose of this session is to connect scholars from numerous disciplinary perspectives to share research about the Székely people and have helped to embed the region’s history in a broader European context.
Abstract author(s): Aviva Noy (University of Miami) - Elinor Karchmer (University of Miami) - David Kohl (University of Miami) - Tamar Weinberg (University of Miami) - Jeanine de Jager (University of Florida) - Jody Huelskamp (University of Florida) - Michael Pizzuti (University of Florida) - Gordon, Andrea (ArchaeoT ek)

Abstract format: Oral

Archaeological investigation of the Városfalva site demonstrates complex polyethnic interactions manifesting into transformed cultural settings. Despite the emergence of personhood, an understanding of place and space within the church grounds is limited. This presentation in the symposium on the archaeology of Medieval Hungary will present observations of the placement of infants and perinates portrayed 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 polythetic interactions manifesting into transformed cultural settings.

POSSIBLE CASE OF JUVENILE RHEUMATOID ARTHRITIS FROM 14TH-15TH CENTURY TRANSYLVANIA

Abstract author(s): Aviva Noy (University of Miami) - Elinor Karchmer (University of Miami) - David Kohl (University of Miami) - Tamar Weinberg (University of Miami) - Jeanine de Jager (University of Florida) - Jody Huelskamp (University of Florida) - Michael Pizzuti (University of Florida) - Gordon, Andrea (ArchaeoT ek)

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 fossas in this juvenile, and its reliance 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 populace at Papdomb and, therefore, provide insight into conceptions of childhood death and the social role of children in medieval Hungarian society.

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, Chold (Central European University)

Abstract format: Oral

Among Transylvanian fields of crops, there is a grassy knoll near Vârcolaca (RD: Drăguşani) 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. Vârcolaca is currently and historically mostly populated by Transylvanian Settlers, with a Hungarian minority. Since 1990, the site of Vârcolaca has been surveyed and excavated by an international team. The excavations have recovered more than 600 burials, and 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 phases of the churchyard. Individuals buried within the various phases of the site 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 appears to limit individuals outside the church wall that were interred post mortem. Analysis of the burial pattern at the site indicates 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.

POSSIBLE CASE OF JUVENILE RHEUMATOID ARTHRITIS FROM 14TH-15TH CENTURY TRANSYLVANIA

Abstract author(s): Verostok, Kirsten (University of South Florida) - Padula, Katharine (Rowan University) - Williams, Devin (SINA International) - Nyaradi, Zsolt (Haáz Rezső) - Gonciar, Andrea (Archaeotek) - 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 churchyard. Rescue excavations were conducted in 2012 and 2013 in the Székely village of Magyargazd in Hungary’s Transylvania region. The skeleton consists of a female juvenile aged 12-13 years old recovered in 2012. The skeleton was recovered and the case study focused on one individual GR-13. Radiocarbon 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 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 appears to limit individuals outside the church wall that were interred post mortem. Analysis of the burial pattern at the site indicates 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.
7 DIET IN THE SZÉKELYFÖLD: PRELIMINARY DATA FROM RURAL TRANSYLVANIA

Abstract author(s): Peschel, Emily (University of Calgary) - Dunn, Tyler (Creighton University) - Nyaradi, Zsolt (Haáz Rezso 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

Investigation of the dietary habits 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 Bölöst. Almost 200 individuals were excavated from a churchyard burial ground used by the people of Bölöst from the 12th to 19th centuries. This initial investigation into Székely diet utilizes dental tissues of 38 individuals.

Collagen δ13C 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 isotope values show a largely C3 plant diet with approximately 90.0±6% of their diet coming from plants, likely millet, a dietary staple in the region since 1500 BCE. The low average δ15N (10.7±0.8%) provides further evidence for a predominantly plant-based diet. There were no significant differences for either δ13C or δ15N values from person to person, which indicates a homogenous diet across the population. Individuals from the 12th to 14th centuries, however, had significantly lower δ15N 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 near resources and increased reliance on millet.

8 DIETARY RECONSTRUCTION OF THE SZÉKELY COMMUNITY OF PAPDOM

Abstract author(s): Trent, Christina (University of South Florida) - Zajdlik, Katie (Western Carolina University) - Nyaradi, Zsolt (Haáz Rezso Museum) - 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 medieval or early modern periods have been investigated previously. This presentation provides novel isotopic data derived from bone collagen and bone apatite samples of Székely individuals who resided at the archaeological site of Papdom. The site of Papdom 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 = 3.0) and apatite-collagen spacing (mean Ap-Coll ∆13C = 6.2, SD = 1.1) broadly suggests that members of the Papdom 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): Zajdlik, Katie - Puckett, Evan (Western Carolina University) - Nyárádi, Zsolt (Haáz Rezso 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 funerary offerings, such as social status and the importance of other than the later periods. Social turmoil from the colonization of and invasions into Transylvania in the 12-13th centuries may have reduced access to near resources and increased reliance on millet.

Collagen δ13C 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 isotope values show a largely C3 plant diet with approximately 90.0±6% of their diet coming from plants, likely millet, a dietary staple in the region since 1500 BCE. The low average δ15N (10.7±0.8%) provides further evidence for a predominantly plant-based diet. There were no significant differences for either δ13C or δ15N values from person to person, which indicates a homogenous diet across the population. Individuals from the 12th to 14th centuries, however, had significantly lower δ15N 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 near resources and increased reliance on millet.

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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 skel-
etal remains of a probable female approximately 25-35 years old at the time of death. Multiple analyses, including X-Ray, SEM, EDX,
CT scanning, and cross-sectional 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 on the
health of a young woman in medieval Transylvania.

c. DIFFERENTIAL DIAGNOSIS AND THE HEALTH IMPLICATIONS OF CALCIFIED NODULES FROM A MEDIEVAL SZEKELY WOMAN IN TRANSYLVANIA

Abstract author(s): Passalaquca, Nicholas (Western Carolina University) - Bethard, Jonathan (University of South Florida) - Zajd-
lik, Katie (Western Carolina University) - Goncier, Andre (ArcheoTek Canada Ltd) - Nyarady, Zsolt (Haáz Rezső
Múzeum)

Abstract format: Oral

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 25.65 x 18.23 mm and 17.62 x 16.98 mm, were found with the skel-
etal remains of a female approximately 25-35 years old at the time of death. Multiple analyses, including X-Ray, SEM, EDX, CT scanning,
and cross-sectional 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 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): Miller, Heidi - Lammin, Jean Louise - Dowdy, Liotta (University of South Florida) - Nyárádi, Zsolt (Haáz Rezső
Múzeum) - Goncier, André (ArcheoTek Canada) - Bethard, Jonathan (University of South Florida)

Abstract format: Poster

In recent years, bilateral retroversion of the glenoid cavity received little attention in the paleopathological literature. The etiology of
unusual glenoid retroversion has been described and criteria for generating differential diagnoses of glenoid retroversion have
been reported. To date, no cases from medieval Transylvania have been described and no examples have been utilized to demon-
strate how medieval Transylvanians managed their daily activities with pronounced anatomical impairments.

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 good condi-
tion. While the proximal humeri were not recovered, retroversion of the glenoid cavities was noted bilaterally and both articular sur-
faces 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 village 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) - Neill, Michael (Uppsala University)

Format: Session with presentation of 6 slides in 6 minutes

Archaemetallurgy is a multidisciplinary field populated by researchers of varying backgrounds. Some researchers have their back-
ground 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 human-
ities or social sciences, trying to understand metal objects and metalworking 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 archeometallurgical
research is often obtained when two or more approaches are combined. This typically requires different specialists to meet and col-
aborate – 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
archaemetallurgical studies. Furthermore, we encourage you researchers to present their work.
350 SUSTAINABILITY, UNSUSTAINABILITY AND OPPORTUNITY FOR ARCHAEOLOGICAL DATA

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

**Organisers:** Wright, Holly - Richards, Julian (University of York) - Ronzino, Paola - Nicolucci, 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 is urgently needed, and archaeologists must work together to raise awareness and take action. The ARANDEplus infrastructure (https://arandee-infrastructura.eu/) and Saving European Archaeology from the Digital Dark Age (COST Action SEADDA, https://seadda.eu/), invites papers discussing the sustainability of archaeological data, examples of open data and data re-use, and techniques 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**

**350.1 DIGGING DIGITAL IN EPHESES – CHANCES AND CHALLENGES OF A LONG-TERM PROJECT**

**Abstract author(s):** Schwager, Helmut - Burkhart, Karl (Archaeological Institute)

**Abstract format:** Oral

Since 115 years archaeological research takes place at the site of ancient Ephesus. 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 is 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 anticipated. 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 buried due to a lack of missing data curator.

SUSTAINABLE ARCHAEOLOGICAL DATA IN NORWAY

Abstract author(s): Ulleberg, Espen - Matsumoto, Mieko (Museum of Cultural History, University of Oslo) - Ora, 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 umnis.no.

As part of the MUSiT cooperation, the museums decided in 2011 to use a common solution for excavation documentation – the Swedish Intrasys (intrasys.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. A 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 CRMarchaeo 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 projectperiod.

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 umnis.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 universities servers.

The museum is in 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.

DIGITAL ARCHAEOLOGICAL DATA IN THE WILD WEST: THE CHALLENGE OF PRACTICING RESPONSIBLE DIGITAL DATA ARCHIVING AND ACCESS IN NORTH AMERICA

Abstract author(s): Fernández, Rachael (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. These agencies, driven by the need to understand the 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 Europana, SEADDA, and ARABDINeplus 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.

CHALLENGES OF MAKING COLLECTIONS ACCESSIBLE. THE CENIEH COLLECTION’S SYSTEM

Abstract author(s): Rojo-Garazar, Joseba - Rodríguez-Méndez, Jesus - Calvo, Cecilia (Centro Nacional de Investigación sobre la Evolución Humana – CENIEH - Cuarta, Gonzalo (University of 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 Léon. 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 Colestolabra, Litho (Litho), CEF (Colección Experimental de Facinología), and Colección de Referencias de Arqueología Dental. Also, since January 2019, the CENIEH is part of the AramidPlus 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 reflection about how to store this information, how can we make it persistent, accessible and available without compromising the data itself, the ongoing research and the integrity of the archaeological sites of provenance.

BEST PRACTICE IN FIELDWALKING DOCUMENTATION: FORMATION OF AN EAA COMMUNITY

Abstract author(s): van Laeuen, Martijn (Groningen Institute of Archaeology)

Abstract format: Oral

For at least the past 26 years archaeologists working around the Mediterranean have struggled, 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 (Barber & Mattingly eds., 1999-2000). But attempts to analyse multiple fieldwalking datasets (e.g., Alcock & Cherry eds., 2004; Launaro 2013) have so far failed to go beyond an uninformative ‘least common denominator’ approach: more, 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 practices; this FASTI Online Survey project is now actively promoting the submission of legacy survey data: online archiving publications a Dutch-UK-Italian research team is test-driving a merged survey database for the area around Rome (see paper by Attener 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 Laeuen, 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.

AND EVERY FAIR SOME TIME DECAYES? TRACKING THE RISE OF PARADATA TO INCREASE DATA SUSTAINABILITY

Abstract author(s): Skold, Olle - Borjesson, Lisa - Hulvå, Ista (Uppsala University)

Abstract format: Oral

Large-scale initiatives for archaeological data sharing (e.g., ARADINE, 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 (Pasquatto, Bergman & Wolford, 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 (Farrel, Frank & Nilak, 2019). So 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 archiving of 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’(Pasquatto, Bergman & Wolford, 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 – for heritage management and scientific purposes – of being able to merge the hundreds, if not thousands, of fieldwalking datasets generated since the 1950s (Barber & Mattingly eds., 1999-2000). But attempts to analyse multiple fieldwalking datasets (e.g., Alcock & Cherry eds., 2004; Launaro 2013) have so far failed to go beyond an uninformative ‘least common denominator’ approach: more, the data of most fieldwalking surveys, and the metadata for nearly all of them, remain unexplained or inaccessible.

The study is part of the Capturing Paradata for documentTing 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 816210.

INTEGRATING MORTUARY DATA IN ARADINEPLUS

Abstract author(s): Aspocek, 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 ARADINEplus partners. The ARIADNEplus project is extending the previous ARADINE infrastructure by integrating data from a comprehensive selection of archaeological subsfieds 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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collections can be searched in the catalogue, burial data is being integrated on the level of the individual graves/mortuary deposits resulting in a large research database with data from a range of ARACIEplus partners. This database has been chosen for this activity not only because it presents one of the more homogeneous archaeological data types, that lend itself for this type of activity, but in particular because such an integrated burial dataset will be directly relevant for archaeological researchers, for example to answer questions related to the distribution of artifacts and burial customs across Europe. In this presentation we will talk about the workflow and discuss the impact that different categorisation and taxonomies of mortuary data, different resolution of the information (i.e. how much detail about a mortuary deposit is recorded) and diverse terminologies have on this integration activity.

8 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 preserveable on a computer. This focus has helped address the principle questions 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-reusing-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
- Data Heritage
- Stratigraphy Standards
- Search Tools

that aim to address two key research questions:
- How can we ensure the sharing, linking and interoperability of archaeological data and information, particularly information derived from the commercial sector 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): Novák, 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 Archival Information System of the CR (AIS CR; http://www.aiisc.cz/), provided a raw impetus in 2006. Since then, it 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 unstandardized 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.

356 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: Krüpper, Corina (Curt Engelhorn Center Archäometrie, Mannheim) - Vida, Tivadar (ELTE-ELTEI Lendőrdő 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 streams 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 isotopes 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 Krüpper) and pursues putting its findings into a wider European context.

1 NEW ELITES AND THEIR HORSES IN THE MIGRATION PERIOD LITHUANIA – STRANGERS OR LOCALS?

Abstract author(s): Kurila, Laurynas - Pilaiuskiene, Gedriu - Simskena, Edvardas - Mildauskienė, Žydrūnė (Vilnius University) - Lidlín, 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 Sátoran de Muros-Chemikov culture, Central West Europe, and Scandinavia met in the Baltic milieu. These are synchronous with increases 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 debate, the question of the origin of the elites is among the main ones. Researchers suggest that emulating Asian nomads or Germanic warriors had reached present-day Lithuania and probably joined the local communities forming their elites, or that Baltic 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 Baltsl and the development of horses of the local type. These regions are studied where the burials of presumably non-locals concentrate: Samogitia, Central, and East Lithuania. The 879/885 and 1231 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 those 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 INSICEALTRA

Abstract author(s): Alonzi, Elisa (University College Dublin; Arizona State University; - Seaver, Matthew (National Museum of Ireland) - van Acker, 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 Insicealtra, set on an island in Lough Derg, Co. Clare, is located towards the southwestern end of the River Shannon. The grey water linking some of Ireland’s most important monasteries. The community that lived on Insicealtra from the sixth to sixteenth 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 monoethnic 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 cemeteries, 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 mobility rates of ethnicity and social layers by analysing modern plants to assess mobility. Results will be compared to rates of mobility from previously investigated iron-age and early medieval monastic and secular sites, and the contrast between mobility and factors such as sex and burial location will be assessed. This study will demonstrate the level to which the monoethnic community on Iniscealla were connected to both the local community and the wider medieval world.

INTEGRATING ARCHAEOLOGY AND STABLE ISOTOPE ANALYSES TO STUDY EARLY MEDIEVAL SOCIETIES IN A BORDER AREA (BASEL, SWITZERLAND)

Abstract author(s): Deapenartier, 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 methodologies in archaeology. This project focuses on late antique and early medieval burials and cremations of the 5th-7th century AD distributed on both sides of the river Rhine, which became a border after the collapse of the Roman administration in the 3rd 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 homogenous entities in which material culture represents a clear ethnic and identity marker. Instead, 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.

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 Archaeoometry, Mannheim) - Koncz, Istvan (ELTE - Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Ödör, János (Wosinsky Múr Museum, Szekszárd) - Rácz, Zsófia (ELTE - Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Hajdu, Tamás - Szeifert, Bea (Institute of Archaeology, Research Centre for the Humanities, Budapest; Hungarian History Museum, Budapest) - Pop, Richárd (Bánsa Museum, Szombathely) - Wolff, Katél (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 early medieval cemeteries and societies at Basel. These groups are not considered distinct and homogeneous entities in which material culture represents a clear ethnic and identity marker. Instead, 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.

DETECTING EARLY HUNGARIANS’ MIGRATION FROM THE URAL-REGION TO THE CARPATHIAN BASIN THROUGH GENETIC CONNECTIONS BETWEEN AND WITHIN THEIR BURIAL SITES

Abstract author(s): Szepfert, Bea (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Csadly, Veronika (Institute of Archaeology, Research Centre for the Humanities, Budapest; Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Hatvany, Daniel (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 (Institute of Archaeology, Faculty of Humanities and Social Sciences, Pázmány Péter Catholic University, Budapest; Hungarian Prehistory Researchgroup, Research Centre for the Humanities, Budapest) - Egied, Balázs (Department of Genetics, ELTE Eötvös Loránd University, Budapest) - Zsólyomi-Nagy, Attila (Institute of Archaeology, Research Centre for the Humanities, Budapest)

Abstract format: Oral

Around 890 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 steppes, 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 were analysed by our research team using archeogenetic methods. The studied populations have di verse 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. Between many of the examined sites we see archaeological parallels, e.g. typical jewelleries or uralic type ceramic. In contrast, at some of the studied sites only a few archaeological findings have been excavated.

PRELIMINARY GENOMIC RESULTS FROM THE MIGRATION PERIOD OF THE CARPATHIAN BASIN

Abstract author(s): Türk, Boris (Department of Genetics; University of Szeged; Department of Archeogenetics; Institute of Hungarian Research) - Náparáczki, Endre (Department of Archeogenetics; Institute of Hungarian Research; Department of Genetics; University of Szeged) - Miető, Zoltán (Department of Pediatrics and Pediatric Health Center; University of Szeged; Department of Archeogenetics; Institute of Hungarian Research) - Maár, Kitt (Department of Genetics; University of Szeged) - Balogh, Csilla (Department of Art History; Istanbul Medeniyet University) - Nagy, István (SlagDiMsics Biotechnology Ltd.; Mórahalom) - Bernert, Zsolt (Department of Anthropology; Hungarian National History Museum) - Pálfi, György - Marsalk, 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 rich findings containing jewels, weaponry and characteristic horse burials, and large commoner cemeteries with poor findings. Previous mtDNA and Y chromosome studies of the elite groups revealed a high proportion asatian 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 mtDNA genotypes from 940 cemeteries and several sequenced genomes from 319 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 Asian immigrants. Population genetic analyses 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 Saika and Tuu-Ruan samples from Kazakhstan on preliminary PCA and MDS plots. Commoner sample maps in a cloud between modern Hungarian and the Conqueror elite, somewhat overlapping the latter may indicate possible ongoing admixture between previous local residents and immigrants.

PRELIMINARY GENOMIC RESULTS FROM THE MIGRATION PERIOD OF THE CARPATHIAN BASIN
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. X122, X121, X121a, X122 b 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 Y chromosome subhaplogroup (N1a-Z196), 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 allow to fill gaps in archaeological records.

This research was funded by the Úrádiais program I.2.2 project and the Thematic Excellence Programme of the MSD Office.

9 THE ANGLO-SAXON MIGRATION AND FORMATION OF THE EARLY ENGLISH CHURCH POOL

Abstract author(s): Göttinger, Joscha (Max Planck Institute for the Science of Human History) - Altina, Eveline (Leiden University Medical Center, University of Leiden) - Papak, Luca (Max Planck Institute for the Science of 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) - Stubbins, 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, outlook that the indigenous Romanised British population was forcibly replaced by invading Germanic tribes, starting in the 5th century AD. However, to what extent this historic event coincided with mass migration 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 affiliations 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. Second, we nevertheless highlight the continuous presence of ancestry identified in Proto-Slavic, Proto-Germanic, Proto-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 ethno-racial processes in which the acculturation and assimilation of native Britons into the migrating 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 located in the West slope of the Uras. 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 rest stages of the Substrate horizons which were formed by ancestors of a population that moved on the Danube at the closest time of the ethnos “Magyar” appeared into narrative sources firstly. We should exclude the problem of the Krasnoyarskoe 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. Komer about the location of the Magyar’s ancient homeland in a nomadic cent in the Ural and Arai sea regions before the 4th-9th century AD. The background of this concept is West Siberia. The Bakul culture presumably belonged to the half-nomadic population that lived in the steppe-strea
gen region of the Tobol and Ishim rivers. Some of their groups could participate in the process of the Magyar genesis including the ancient Turks, Samoyedic, and the Ugric tribes, which had been living on the same territory during the 4th-7th centuries AD period. Future studies could be closer to the controversial 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): Toncal, Anita - Trautmann, Bernd - Kropf, Eva - Velte, Marén - Harbeck, Michaela (Bavarian State Collection of Anthropology and Palaeoanatomy, 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 necropoles 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. Scholars have sought the reasons for the formation of this population as well as the migration from different regions. However, the proportion of these immigrants is controversial. For this purpose strontium isotope analyses were carried out on 59 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 mi- gration 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 in populations, 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 ratio for the area of Altenerding, different approaches were tested and evaluated. Therefore, the 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 96%.

357 CHRISTIANITY AT THE FRONTIERS

Theme: 2 From Limes to regions: the archaeology of borders, connections and roads

Organisers: Moreau, Dominique (Université de Lille; HALMA-UMR 8164 research centre) - Petru, Radu (Muzeul de Istorie Naţională şi Arheologie din Constanţa)

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 the level of militarisation. The “limes” being theoretically the most militarised area in Late Antiquity, it should 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 the 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): Rustemier, 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 appear to contain churches, some of which have been identified by previous research, e.g. Benian-Ala Miliaria, Drah-Souid and Gouea. 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 appear to contain churches, some of which have been identified by previous research, e.g. Benian-Ala Miliaria, Drah-Souid and Gouea. 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 appear to contain churches, some of which have been identified by previous research, e.g. Benian-Ala Miliaria, Drah-Souid and Gouea. 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 appear to contain churches, some of which have been identified by previous research, e.g. Benian-Ala Miliaria, Drah-Souid and Gouea.
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 the area in the Danubian valley that belongs to present-day Serbia, for the needs of construction works on two large hydro-energetic systems (Seradaj 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 waler 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 necropoleis, 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 RIPENSI

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 Armenia. This doctrine was at the centre of violent political-religious struggles and major ecclesiastical controversies in the Balkans, because of the passionate rivalry 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 Neo-arian 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, 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 6th and 5th centuries, in its variant developed by Barcusus of Naissus. The Arian-Bonosiac “hersy” 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 “hersy”.

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 contacts through the analysis of all the available sources, according to the perspective of global history of the “Landscape Archaelogy.”

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 Italy is highlighted by archaeological evidences related to the Byzantine Church of Jesus and Mary, once known as “Santa Maria Cerei” but also to the rock churches, one of which several crosses carved in the rock, probably related to an early Christian community.
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 material, whereas 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 ARCHAEO METALLURGICAL RESULTS

Abstract author(s): Giardino, Claudio - Zappatore, Tiziana - Vagati, Floriana (University of Salento)

Abstract format: Oral

Much evidence relating to consistent iron working activities was found at Pantanella in the Chios of Metapontum, an important city in Magna Graecia situated on the gulf of Tarantum. 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 Pantanella 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 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 senatorial edict that prohibited mining in the Italian Peninsula (2nd – 1st century BC), the metals arrived thanks to long distance trade, mostly from the Iberian Peninsula or from the North Alpine mines.

3 IRON SMELTING DEBIRS ON A SMALL LAKE ISLAND: EVIDENCE OF ACTIVITY OR DISPOSAL OF WASTE?

Abstract author(s): Strimmanie, Andra (Department of Archaeology, Lithuanian Institute of History) - Seliskienė, Audra (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 archaeometallurgical surveys, 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 immediate smelting place due to possible factors of renewing, 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 hilltops or settlements. The latest research, however, shows that habitation sites aren't the only places where metal-related evidence can be found. A newly discovered site on a small lake island presents a significant, albeit atypical, addition to the existing metallurgical-related records from the Iron Age. New information was acquired during soil sampling and magnetic 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): Bernaerts, Paulina - De Clercq, Wim - De Grave, Johan - Dawsela, Sijen - 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 the processing of iron occurred in a rather large-scale operation.

In addition to the existing metallurgy-related records from the Iron Age, new information was acquired during soil sampling and magnetic 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.

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 method we are able to answer a number of questions, such as the differences between iron produced in blast and bloomery furnaces, the differences between producing knives and scissors 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 PHYSICOCHEMICAL CHARACTERIZATION FROM RECENT ARCHAEOLOGICAL EXCAVATIONS IN ROGALAND REGION, SOUTH-WEST NORWAY

Abstract author(s): Gjertsen, Kidane - Fyllingen, Hilde - Denham, Soan - Bell, Thea - 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 interpetation 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 also of use for documentation of the material characteristics of these materials. New information can be gained about past technologies in iron smelting and subsequent processing in different periods and regions. Classifying the materials, as those originating from smithing and smelting slags or other slag like or metallic materials, is not often a straightforward endeavor through visual examinations of the physical attributes alone, unless supplemented by physicochemical characterizations. Furthermore, by knowing the composition of the slag and the conditions of extraction (e.g. whether the smelting processes indeed were successful from the 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 ARCHAEO METRIC TOOLS

Abstract author(s): Mazią, Beata - Młodziński, Paweł (University of Wrocław, Institute of Archaeology)

Abstract format: Oral

Studies of the coins are very important to provide us 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 determination of its type. It is possible. This is very important in social studies. The second is the archaeometrical research and the recognition of the coin alloy. Significant in the technological studies. The research are often joined with the more advanced analysis 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 mathematical calculations. Finally the groschen were investigated by EDS-XRF and SEM-EDS.
to recognize the silver fineness and confronted the results with the mine-law. During these studies, the problem with the proper 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.

Toss a Coin to Your Miller: An Investigation of a Curious Set of 16th Century Casting Tools from Tallinn, Estonia

Abstract author(s): Siagia, Ragnar (University of Tartu) - Wärmeländer, 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 1579 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 these tokens 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.

Archaeometric 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 (Universidad de Zaragoza) - 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 methods, of the same characteristics, of the same period. In the laboratory, we can deduce data such as the temperatures at which the metal was heated, the cooling rate of the piece, if the piece was steamed or heated, and the presence of any cracks or defects. We can also use these data to infer the age of the metal and the conditions under which it was produced. The results of this study can be used to better understand the production and use of iron in the period in question.
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.

1 SICYL IN TRANSITION: A GLIMPSE INTO REGIME CHANGE THROUGH DENTAL CALCULUS ANALYSIS

Abstract author(s): Mutri, Giussapina (The Cyprus Institute) - Alexander, Michelle - Carver, Martin (Bioarch, Department of Archaeology, University of York) - Moltuni, 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 sixteenth 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, 6th-9th century) to the Aghlabid (Arabic speaking, Islamic, 9th century) to the Kalbili (Arabic speaking, Islamic, 10-12th century) to Norman (Latin/French speaking, Christian, 11th to 12th century) and, finally, Swabian (Latin/German speaking, Christian, 12th-13th century) regimes is examined by means of dental calculus microchemistry. 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 forms in the mouth. In addition, dental calculus is an important reservoir for particles that are accidentally ingested 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 residue, stable isotopes, ancient DNA) in order to reveal diet, economy, mobility and the ways these changed between the sixth and sixteenth 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/1216/0203).

2 THE MEDICAL PROJECT: EXPLORING MEDICAL REMEDIES IN MEDIEVAL LEPROSARIA THROUGH DENTAL CALCULUS ANALYSIS

Abstract author(s): Forin, 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 - Maria 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 foods, 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 leprosaria hospitals of Saint-Léonard (England) and Saint-Thomas d’Aizier (France) will be presented and discussed.

3 STARCH, PHYTOLETHS, 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 macrofossil/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 with two weeks of arriving at Jamastown, 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): Radina, Anita (BioCh/Ch and York Jezol 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, assesses 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. Potentially and limitations of particular taxon 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 tartar may provide novel insights into living 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 REPLICA

Abstract author(s): Dietrich, Laura - Hablt, Max (German Archaeological Institute, Orient Department)

Abstract format: Oral

During the 10th and 9th millennium BC, at Göbekli Tepe in southeast Anatolia Anatolian 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. The search for答案 was started by the study of grinding stones discovered at Göbekli Tepe, ranging from flat slabs over deep bowls to mortars, pestles and handstrokes. The current paper will focus on the handstrokes, which proved to be very informative regarding functional analysis. In order to handle the unusually high number of finds, functional analysis was conducted in three steps. First, all finds were analysed 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 realised. 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 (Department 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) - Bonic, 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 morphology 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. Geometric 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, Weiyu (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 excavations 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
recently conducted research on the Jahu grinding tools to explore the Neolithic foodways at the site; b) to investigate the influence of food and food-related activities on the Jahu inhabitants in terms of their health conditions.

8 APPROACHING DAILY LIFE AT THE LATE PALAEOLITHIC 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 Palaeolithic camps. The systematic context of our research concerns the following questions commonly asked in respect to the analysis of Palaeolithic 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 Lubraź 10, Western Poland. As one of the most important integrative elements of Palaeolithic 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/H33/043134; financed by National Science Centre, Poland.

9 BURNING QUESTIONS ABOUT MESOLITHIC SITES

Abstract author(s): Halbrucker, Éva – Fairs, Géraldine (Ghent University) – De Kock, Tim (University of Antwerp) – Vandendriessche, Hans – Crulde, 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, we still know little about the exact impact of fire on lithic artefacts, which are frequently found within palaeolithic hearths. Even less is understood about the effect of burning on microscopic wear traces. To address this gap, we conducted several experiments on a interdisciplinary project at Ghent University combining geologists and archaeologists. Experimentally used replicas of Mesolithic fire 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 temperature, 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 (30-70%).

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. Ware 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, Zrenian Institute of Archaeology, University of Hafia) – Spiteri, Cynthianne (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhard Karls Universität Tübingen) – Rosenbreg, Danny (Laboratory for Ground Stone Tools Research, Zrenian Institute of Archaeology, University of Hafia)

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 a shift 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 a few finds to explore 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 DECRIPHER DIETARY PATTERNS OF HILLFORT ASSEMBLAGES IN MEDIEVAL EUROPE

Abstract author(s): Brown, Sophie (University of Bristol) – Rustekytė, Aukšė (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) – Everard, 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 O-IRMS analyses on shed 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 sources. Due to varying metabolic and biosynthetic pathways for fatty acid production in different organisms, it is possible to distinguish between daily, running (non-runaway adipose) fats via determination of δ13C 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-MEIDIEVAL MEALS: AN INTEGRATION OF NEW AND OLD STABLE ISOPE STUDIES ON DIET IN ITALY

Abstract author(s): Tytck, Robert (University of South Florida)

Abstract format: Oral

Over >35 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/animal samples; 3) different dietary calculations for apatite/enamel data; (4) having sufficient local and contemporary isotope data: (1) cross-calibration of mass spectrometers between laboratories; (2) different sample preparation methods, for apatite/animal samples; 3) different dietary calculations for apatite/enamel data; (4) having sufficient local and contemporary isotope data. Cross-calibration is straightforward, but use of different chemical procedures for preparing apatite/animal 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 foodbeing 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 baseline isotope values 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.
CRUMBLE: STUDYING FOOD PATTERNS AND MOBILITY IN BELGIUM FROM THE LATE NEOLITHIC TO THE MERovingIAN PERIOD  

Abstract authors: De Mulder, Guy (Ghent University) - Snoek, Christophe (Vrije Universiteit Brussel) - Capuzzo, Gaetano (Université Libre de Bruxelles) - Dale, Sarah - Sabaux, Charlotte (Ghent University) - Tys, Dries - Aneart, Ria - Huij, Marta (Vrije Universiteit Brussel) - Vercauteren, Martine - Warnenbol, Eugène (Université Libre de Bruxelles)  

Abstract format: Oral  

The CRUMBLE-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 northeastern Europe) between ca. 3000 BC and 900 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 as 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 of the bio-available strontium in the different geological regions of Belgium will be produced. The running project is a cooperation between Ghent University, both Brussels universities (ULB and VUB) and the radiocarbon laboratory at the Royal Institute for Cultural Heritage supported by the Excellence of Science budget (FWO-FNRS).  

MEAT OR FISH?: THE NEW ISOTOPE AND HISTORICAL EVIDENCE OF 17-18TH C BASILIAN MONKS’ DIET IN VILNIUS, LITHUANIA  

Abstract authors: Smiıkion, Edvardas (Vilnius University, The Lithuanian Institute of History) - Jakulis, Martynas - Kozakaitė, Justina - Pliskauskiene, Gedre (Vilnius University) - Lidin, 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 Byzantine-Galician 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 meal 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.  

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 FUNDUSO FROM THE XII-XIII CENTURIES OF THE SAN ESTEBAN ARCHAEOLOGICAL SITE (MURCIA, SPAIN)  

Abstract authors: Gijón, Ramón - López, Miguel Cecilio (Universidad de Granada) - Uriarte, María - Rodríguez, Jorge (Universidad de Murcia) - Igurza, Alena (FIDOCR) - Botella, Hermínia (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 fundus stands out, dating back to the XX-XI centuries. This space had an important role in the commerce of that time.  

With this finding, it was decided to realise 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 cadaveric 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 analyzes 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 hare.  

RECONSTRUCTING SUBSISTENCE PATTERNS AT LYDENBURG HEADS SITE, SOUTH AFRICA USING LIPID RESIDUE ANALYSIS  

Abstract authors: Roeker, Julia (University of Tübingen) - Schoeman, Alex (University of the Witwatersrand) - Whitelaw, Gavin (Kwazulu-Natal Museum) - Collins, Jean-Pierre (Lydenburg Museum) - Sipeter, Cynthia (University of Tübingen)  

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 Uniate tradition farming community in the seventh century AD, and by a Kalinga, Traditional 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 (Uniax occupation, n=20; Kalungu 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.
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 33 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 peers 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): Cotofeanu-Arincu, Laura (University of Barcelona; Archaeology and Gender in Europe - AGE - Community of EAA); Gaydaranta, Bisserska (Archaeology and Gender in Europe - AGE - Community of EAA); Plutnik, Silvian (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 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.


Abstract author(s): Nakash, Beth (University of Arizona)

Abstract format: Oral

In 2014, 2015 and 2019, 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 for 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 trends that have occurred over these past few years that may change the current course; 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, Marcello – La Serra, Cristiana – Cerbone, Oriana – Leonelli, Valentina – Pennisi, Ghiselda – Manca di @italo

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, up 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 36-40, 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 type of discriminations.

However, in the difficult context of Italian freelances, there may sometimes be favourable situations coming from local environment 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 TAI UCL 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) – Roe, Cat (G(R)Archaeology) – Connelly, 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 practising 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 Equities 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 (IEAH: Inclusion, Diversity Equities in Archaeology and Heritage). Initiatives by the Respect Campaign have included the creation of safe online spaces for women and LGBTQI+ 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 LGBTQI+ SPACES

Abstract author(s): Tabot, 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 1500+ individuals and the name has been altered to reflect our growing LGBTIQA+ members to Mentoring Women 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 Seating Red period and menarcheation 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 LGBTIQA+ minorities with much needed networking and confidence building 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 questions and answer sessions where anyone in the group can ask our an issue that is 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 LGBTIQA+ spaces has provided necessary support to grassroots level to minority groups, as well as an increase in mental health and general well-being through being part of a wider, safer community. This includes data where many individuals where more confident to raise issues such as bullying in the workplace.

7 #UTGRAVINGPÅGRÅ #EXCAVATIONINPROGRESS

Abstract author(s): Aldin, Rude Petra (Røt Gutåborg) – Ramstrøm, Arne (Arkologi gruppe)

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 and speak out against sexual harassment, bullying and related forms of discrimination. The #utgravingspågrå #excavationinprogress movement started circulating on social media in Sweden, and the hashtag quickly grew to over 700 members. The hashtag quickly grew to over 700 members and the group was flooded with testimonies of sexual 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 AEG survey, and 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.
and violations, both from the past and in the present. When *utgrävningstag* was presented to the media and published in the national newspaper Dagens Nyheter on November 30, 2017, 397 archaeologists had signed the statement against harassment. *Utgrävningstag* 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 *Utgrävningstag* continues, with an unabashed 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.

**FEMALE ARCHAEOLOGISTS IN DEVELOPER-FUNDED SECTOR IN EUROPE: “STILL STRUGGLING BUT UNITED!”**

**Abstract author(s):** Mazzieri, Francesca (Cambridge Archaeological Unit, University of Cambridge; McDonald Institute for Archaeological Research, University of Cambridge; University of Bergen); Watson, Godlie (MOLA - Museum of London Archaeology); Simões, Sara (Cambridge Archaeological Unit, University of Cambridge); STARG - Sindicate dos Trabalhadores de Arqueologia/Portuguese Union for Archaeologists) - Brito, Sara (STARG - Sindicate 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. Women in Archaeology (WICAH) is an initiative run by the Women’s Specialist 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 archeology 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 Sardigna to help women freelance. These are some examples of initiatives 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 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.

**NETWORKS OF CHRONOLOGY AND CHRONOLOGICAL NETWORKS**

**Theme:** 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, artefactual typology and structure and site type. Studies may be focussed on types of structures such as cemeteries 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 see 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 Age? If we avoid these traditional structures do we free ourselves to have a more effective conversation across Europe for change, interaction and communication networks? Does a calendar based chronology allow us to see networks more clearly or do we free ourselves to have a more effective conversation across Europe for change, interaction and communication networks?

**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 to different ‘styles’ in line of ornament and not about the different methods of production of metal artefacts). There was no common understanding about the different methods of production of chronologies with concepts such as ‘periods’ defined by ‘type fossile’ (e.g. the ‘Reinrake’ system which had been taken over from Geology; ‘variation’ (originating with Finders Petrie in Egypt); and ‘horizons’, with the appearance of a single attribute (e.g. the stone / bronze / iron of the Iron Age System, or ‘Tischler’s brooch chronology’). My own approach has been based on variation starting from stratigraphic 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. It also assumes that spread between different communities along various types of networks and that ideas (and people) will be moving in many different directions rather than from one source as assumed in invasion interpretations. Thus new individual attributes can appear anywhere in a network, and the contributions they can appear 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 ARTIFACTS 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 artifactual and historical knowledge required to develop these systems is commendable and should be respected but may also be challenged. They rely on 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. Related 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 revist 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 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 UNFINISHED ASSEMBLAGES FROM DENMARK**

**Abstract author(s):** Røse, Helene (Centre for Baltic and Scandinavian Archaeology, CRC 1266, Kiel University) - Meadows, John (Centre for Baltic and Scandinavian Archaeology, Leibniz-Institute 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, possibly 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 between 350-250 BC has however proved more influential on our analyses, as it produces b-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 Århusgaard, Aarøe and Sahale umfield cemeteries in southern Jutland, Denmark. The cremated bone dates are corrected for wood-age offsets using formal outer 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 wide range of ceramic and metal artefact currences. We investigate small scale change: the rate at which new types are introduced and abandoned, changes in 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 revist 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 present the results of our project that has tested this methodology through the medium of Iron Age brooches.
4

WHEN ONLY TYPOLOGY REMAINS. NEW RESEARCH ON EARLY IRON AGE STANOMIN STYLE ORNAMENTS FROM CENTRAL EUROPE

Abstract author(s): Maciejowski, 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 (Suziattan Umfallden culture), from the beginning of archaeology, 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 – Wielenkopfka, 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 heretofore 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 Stanomin style ornaments. They have been located in the region from Denmark to western Ukraine, with the largest concentration in eastern Poland (Kuyavia, Masovia, and Mielno). 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 a more detailed chronological division? 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 time series – 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 their wealth 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. Besides 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 typological approaches, new methods and perspectives emerged in the last years. These include the radiocarbon dating of organic remains preserved in metal artifacts, 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 SOUTHERN ALPINE REGION?

Abstract author(s): Cremon, Marija (University of Ljubljana, Institute for the Protection of Cultural Heritage of Slovenia) - Armit, Ian (University of York) - Msson, Phillip (Institute for the Protection of Cultural Heritage of Slovenia) - Harris, Samuel - Batt, Catherine (University of Bradford) - Mela, Marko (Universalselmiuseum Joanneum) - Potrebica, Hrvoje (University of Zagreb) - Czajlik, Zoltán (Eötvös Loránd University)

Abstract format: Oral

Combining the results of traditional typological 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 included the financial means for post-excavation research, which besides the basic studies includes absolute dating, in order to provide a more comprehensive picture of the as-cast find complexes. 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.

The contribution will discuss in detail the evidence and the complexity of Southern Alpine copper exploitation through the 3rd and 2nd millennia BC. Two case studies from the Italian Alps – Nevio (Bolzano) and the metal hoards from Pigloner Kopf (Bolzano) – will be presented. The evidence indicates that the earliest extraction of copper in this area date to the Late Neolithic period, based on the radiocarbon dating of organic materials found in association with the hoard assemblage. Furthermore, the extraction of copper in this area increased considerably in the Early Bronze Age, with the exploitation of the copper deposits at the earliest known site in the South-Eastern Alps. New data on the metal hoard from Pigloner Kopf (Bolzano, Italy, dated to the first half of the 3rd millennium BC) will be presented at this conference.

The contribution will also discuss the evidence and complexity of the exploitation of iron in the South-Eastern Alps. Despite the fact that the first iron smelting site in this region is dated to the 1st millennium BC, it is still an area of much research interest. The conference will discuss the evidence for iron production in this area and the significance of the finds in the context of European iron production in the Early Iron Age.

The session aims to discuss new approaches and gather 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. The focus will be on the evidence for 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.

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

Organisers: Cazavattuzi, Claudio (Institute of Archaeology, Hungarian Academy of Science, Museo della Civiltà in Roma) - Arena, Alberto (Istituzione Università di Roma) - Gavranovic, Mario (Institut für Österrheinische und Europäische Archäologie OREA, Austrian Academy of Science, Vienna) - Kiss, Viktória (Institute of Archaeology, Hungarian Academy of Science) - Mehoffer, Mathias (Vienne Institute for Archaeological Science - VANS, University of Vienna)

Abstract format: Oral

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 this area is a significant development for the region, with the evidence provided by the coeval smelting site of San Carlo, and by the studied metal objects related to the Rinaldone Culture.

Abstract format: Oral

Recent analyses of the metal axes of the Ixoinum 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.

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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 MILENIUM 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 axes of the Ixoinum 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.

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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.
LIVING ON THE EDGE: BRONZE AGE CERAMIC PRODUCTION AND EXCHANGE IN EASTERN HUNGARY

Abstract author(s): Galló, Mark (University of Notre Dame) - Kráter, Attila (Hungarian National Museum) - Rébe, Daniella (University of Illinois at Chicago) - Duffy, Paul (University of Toronto) - Pardik, 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. 1600-1050 BC), in particular, the cremation urn cemetery of Békés 103 (Hévízi-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 ware 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.

CONTACTS AND MOBILITY BETWEEN THE CARPATHIAN BASIN AND THE TRIESTE KARST BASED ON NETWORKING AT THE BEGINNING OF THE LATE BRONZE AGE IN THE SOUTHWESTERN CARPATHIAN BASIN

Abstract author(s): Dario Zuppi, Matteo Fazio, Daniela Zuppi, Emanuele Muscara

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 in the Carpathian Basin. However, the beginning of the Late Bronze Age in the Carpathian Basin is characterized by intensive contacts with distant European regions and by the appearance of new styles in the material culture which are the basis for researching exchange networks in a specific time period. The present paper, based on the exploration of the settlement network in the territory between the Drava and the Adriatic Sea, presents some preliminary remarks concerning the complexity of the settlement network in this period. The analysis of the settlement network in the territory between the Drava and the Adriatic Sea opens a new perspective for the interpretation of the archaeological record in this region. The study of the settlement network in this region allows to investigate mobility in the geographical and socio-political context. At Fonó Pávián and Csanádombi cemeteries (Saran Mare culture, Poplán) isotopic evidence shows a significant presence of non-indigenous female individuals. At Fonó Pávián we observe that non-local status of the females could also be emphasized by the position and orientation of the body in the burial. At Csanádbal 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 sacrificial spirals - a typical female ornament of the eastern Alps - might indicate that woman 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.

FEMALE MOBILITY AND EXOGAMY IN BRONZE AGE COMMUNITIES. A WIDESPREAD PRACTICE?

Abstract author(s): Ibolya Jenécsic, Brina (University of Ljubljana)

Abstract format: Oral

Recent studies in Eastern and Southern Europe 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 patriarcal systems to establish or consolidate political alliances and/or exchange networks.

The methodological advances in isotopic and aDNA analyses are having a crucial role in tracing 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 under-estimated. In our talk, we will present a synthesis of three case studies from Middle and Late Bronze Age sites in Italy, where the integration between an artifact-based approach (distribution of types and technological traits) and strontium/oxygen isotopes analyses has allowed to investigate mobility in the geographical and socio-political context.

SOCIAL INTERACTION AND MOBILITY AT THE DAWN OF THE URNFIELD CULTURE IN THE SOUTHWESTERN ALPINE REGION

Abstract author(s): Ivor Jenečić, Brina (University of Ljubljana)

Abstract format: Oral

The onset of the Urnfield Culture (Burial Ground) in Western Europe at the beginning of the Late Bronze Age (13th century BC) marked a significant shift in the social and cultural landscape. In the southwestern Alpine region, recent archaeological research has shed light on the nature and extent of social interactions during this time period. The transition from the Middle to Late Bronze Age is characterized by the appearance of new material culture and practices that signaled a shift in social ideologies and economic strategies. The network of contacts between different regions, such as the Carpathian Basin and the Alps, played a crucial role in the diffusion of these new cultural elements. The study of mobility patterns, through the analysis of material culture and settlement distribution, provides valuable insights into the social interactions and the dynamics of exchange networks in the southwestern Alpine region. This presentation will focus on the exploration of the settlement network and the analysis of material culture in the territory between the Drava and the Adriatic Sea, which is located in the southeastern part of Slovenia. The analysis of the settlement network in this region allows us to investigate mobility in the geographical and socio-political context. At Fonó Pávián and Csanádombi cemeteries (Saran Mare culture, Poplán) isotopic evidence shows a significant presence of non-indigenous female individuals. At Fonó Pávián we observe that non-local status of the females could also be emphasized by the position and orientation of the body in the burial. At Csanádbal 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 sacrificial spirals - a typical female ornament of the eastern Alps - might indicate that woman 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.

NETWORKING AT THE BEGINNING OF THE LATE BRONZE AGE IN THE SOUTHWESTERN CARPATHIAN BASIN

Abstract author(s): Loiszyk Dzidar, Daria (Institute of Archaeology, Zagreb)

Abstract format: Oral

The beginning of the Late Bronze Age (“Bácskai”) 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 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 typological 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.
Mortality, whether by senescent or violent causes, adds to the population the deponents of its increase, and perpetuates the race.

Abnormal burials should be interpreted in terms of individual human behavior: the construction of a residence, the ideologies, the customs, the beliefs, the laws, the social structure, the economy, the religious beliefs, the geographical factors, the climate, the medical practice.

A few specific cases are known where non-traditional burials have been identified, such as the case of a female skeleton from an Early Neolithic site in the UK (Ball 2000). However, the analysis of these cases suggests that they may be the result of a specific period of time, and not necessarily a reflection of broader cultural trends.

In conclusion, the study of non-traditional burials can provide valuable insights into the cultural and social practices of past societies. However, further research is needed to fully understand the significance of these practices and their role in shaping human societies.
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.

OVER THE HILLS AND FAR AWAY: CONNECTIVITY WITHIN AND ACROSS MOUNTAINOUS REGIONS IN THE BALKAN EARLY NEOLITHIC

Theme: Networks, networking, communication: archaeology of interactions
Organisers: Dzhanfezova, Tanya (University of Oxford) - Grebiski-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 considered as natural boundaries. The web of interactions underlying past societies and the trigger for these networks to emerge will be considered within Neolithisation 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 and providing 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 technological and causal productions based on various raw-materials (clay, flint, bone, etc.), as well as such focused on land use and subsistence patterns.

ABSTRACTS

1 CONNECTIVITY OR DIVERSITY? ILINDENTSII AND BREZHANI-ON THE TWO SIDES OF THE KRESNA GORGE, THE MIDDLE STRUMA VALLEY, SOUTHWESTERN BULGARIA

Abstract author(s): Kulow, Malgorzata (Regional Museum of History-Blagoevgrad) - Vinugue, Julien (CNRS, Paris Nanterre)
Abstract format: Oral

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?

In the context of the possible cultural affiliations, the analysis of the pottery and certain architectural patterns reveals rather interesting situations. The pottery from Brezhani is much more oriented to the north, to the area of the Galabkin cultural group but also to the east, the territory of the Karanovo 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 stages and poles. 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.

2 WEST-EAST AXIS OF CULTURAL CONTACTS IN SOUTH-WEST BULGARIA DURING THE EARLY NEOLITHIC

Abstract author(s): Kulow, Malgorzata (Regional Museum of History-Blagoevgrad)
Abstract format: Oral

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?

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 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 II, are found special cult objects, the so-called altars with stair-like legs, remarkably similar with those characteristic of the Valushivene 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 material revealed at the sites of Ilindentsi and Drakoveko 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 is rather the East-West axis that played major role for the Early Neolithic connectivity in the region of the Middle Struma Valley.

3 INTERCONNECTED LANDSCAPES? AN ASSESSMENT OF RIVER VALLEYS AS THE PRIMARY PATHWAYS OF COMMUNICATION DURING THE BALKAN EARLY NEOLITHIC

Abstract author(s): Whitford, Brent (University at Buffalo)
Abstract format: Oral

It has long been argued that the rapid transmission of early agricultural practices during the Balkan Early Neolithic, from Thassos 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 hypothesise 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 homogeneous with regards to their connective potential and whether alternative pathways might also be apparent in the region.

4 POINTS OF VIEW: CONNECTIVITY ACROSS MOUNTAINOUS REGIONS REVEALED BY EARLY NEOLITHIC BALKAN POTTERY TECHNOLOGY AND FLINT INDUSTRIES

Abstract author(s): Dzhanfezova, Tanya (University of Oxford) - Gurau, Maria (Bulgarian Academy of Sciences, Sofia)
Abstract format: Oral

Most models of Neolithisation in Southeast Europe focus on single categories of artefact and these often are based on either pottery or flints. 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. 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 toolkit is examined in association with flint provenance and distribution. The interactions between the two technologies is considered in spatial, social and cultural contexts. 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.

5 READING THE PATTERNS, TRACING THE PAINT: PAINTED POTTERY TECHNOLOGY REVEALS EARLY NEOLITHIC SOCIAL NETWORKS AND COMMUNICATION ROUTES IN SOUTH-EAST EUROPE

Abstract author(s): Dzhanfezova, Tanya (University of Oxford)
Abstract format: Oral

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 to establish 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. The chaîne operatoire of this multi-stage complex technology has demonstrated both the conservative traditions and the innovative practical approaches in producing the characteristic painted pottery style (Dzhanfezova 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 specificities. 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.

This specific technological point of view enables us to detect network hotspots and interrelations between individual sites or re-
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 of Koprivets is located in Central Northern Bulgaria, on the second terrasse of the Baninski Lom River, a tributary of the Rusenski 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 Haclar in Anatolia, and to the monochrome layer at Hoca Cosmin, located at the mouth of the Martiza River. The later Early Neolithic layer contains pottery with red angobe 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 Bulgarian Peninsula – the regions of the Middle Struma River valley and Pelagonia. Although the settlement at Koprivots shapes the North Bulgarian Kopyriets cultural group, it is also closely associated with the cultural dynamics established to the south of the Strara Planina mountain. Among the most important questions here are: which routes were used by the first settlers arriving at Koprivots? 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?

THE EARLY NEOLITHIC SETTLEMENT AT OZHULINITSA (NORTH BULGARIA) AND ITS MULTILATERAL CONNECTIONS

Abstract author(s): Elanski, Nedko (Regional Museum of History - Veliko Tarnovo)

Abstract format: Oral

The papers focused on the multilateral cultural interrelations demonstrated by an Early Neolithic site located in Central North Bulgaria. The earliest phases of its development reveal archaeological materials indicating that the settlement represents the Early Neolithic site investigated in the region of the Vatra and the Rusenski Lom River valleys. Dating back to the last quarter of the 7th millennium BC, its artifacts showing characteristic local features are found together with imported archaeological materials. This combination reveals the very dynamic interrelations between Dzhulyunitsa and other settlements located in various directions, including such sites that are placed across mountainous regions. A series of finds are indicators for long-distance connections, showing close resemblance to components of the Anatolian and the Mesopotamian cultures. The papers 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 the individuals, taking into account the role of the community as a whole.

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 South and 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 millennia BC). The first includes settlements located to the North of the mountain - Dzhulyunitsa-Smerdesh, Beljakovo-Moticha, Samovdene and others, whereas the second consists of South Bulgarian sites, among which the tells Karanovo, Azmashka mogila and Nauchena. 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.

THE USE OF OCHRE AND THE PROCESS OF NEOLITHISATION OF SOUTHEAST EUROPE

Abstract author(s): Kosicov-Załąpka, Julia (Agelgliöanian University, Cracow)

Abstract format: Oral

There has been intensive discussions associated with the characterisation of ‘Neolithisation process’ and, correspondingly, many attempts to categorise prehistoric agents by using different categories such as, the ‘Neolithificate package’, or agrarian utopias within the ‘Neolithification 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 examples 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 broad 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 directed 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 centrifuge.

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GOING FORWARD, LOOKING BACK: EARLY NEOLITHIC RAW MATERIAL PROCUREMENT AND FORMATION OF COMMUNICATION ROUTES BETWEEN THE BALKANS AND CARPATHIAN BASIN

Abstract author(s): Batic, Katarina (Institute of Archaeology, Zagreb)

Abstract format: Oral

In the early Neolithic, locatig good sources of raw material such as flint and clay was essential for daily life. Settlements of Starčevo type 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. How to interpret clay deposits and how to extract process, such as Starčevo (Aranđelović-Garašanin 1954), Slavonski Brod – Galovo (Minichreiter 2007), Našice – Olimpija (Dimitrijevic 1974; Marković et al. 2016), several positions at Bakovo (Hrljak 2010, Bukli 2014a), Podgorač (Marković 1971; 2002; Minichreiter 1992, Marković et al. 2016) etc. This settlement pattern would suggest specific strategy further underlining 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 (Šolić Klinšč 2018). Recent research regarding the position of deposits of raw material used at this site suggests that it partially came from the area between Đoboj, Maglaj and Grčanica in northern Bosnia (Šolić Klinšč 2018). The area is relatively close to Đorđica Turba where deposits easily reachable by walk through Spreča river valley at Ovče Do, and by boat through Sava river valley sites to the north as well as Obra 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 Sava river valley sites to the north as well as Obra 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 (Ethem et al. 2017).

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: Dzhanfazova, Tanya (University of Oxford) - Gjebiska-Kulow, Malgorzata (Regional Historical Museum - Blagoevgrad)

Abstract 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 Neolithisation 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 do 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 technological and coeval productions based on various raw-materials (clay, flint, bone, etc.), as well as such focused on land use and subsistence patterns.
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 (JAD) took place in France from Friday 14 to Sunday 16 June 2014. 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 JADs opened up to European participation: 19 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 archaeological 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.

1. NETWORKS, NETWORKING, COMMUNICATION: ARCHAEOLOGY OF INTERACTIONS

Organisers: Romero Mayorga, Claudia (Ere Museum of Greek Archaeology, University of Reading) - Lloyd, James (University of Reading) - Bellia, Angela (Institute for Archaeological and Monumental Heritage, Rome, Archaeoarchitecture Interests 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 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 (iefs) 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 the 12th century BCE – 4th century CE).

We encourage papers on topics such as, but not limited to:

The Cross-Cultural Crossbar/ Music and the High CS

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

Abstract author(s): Romero, Claudia (Ere Museum of Greek Archaeology, University of Reading) - Lloyd, James (University of Reading) - Bellia, Angela (Institute for Archaeological and Monumental Heritage, Rome, Archaeoarchitecture Interests Group of the Archaeological Institute of America - AMIG)

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We encourage papers on topics such as, but not limited to:
Abstract author(s): Kolotourou, Katerina (Independent researcher)

Abstract format: Oral

When music changes, the state changes with it (Damon of Oa, fr. 370 B 4-K)

This increased material and iconographic evidence for the use of percussion instruments in funerary and ritual contexts documents one of the most profound transformative 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 landscapes is in sharp contrast with the limited Aegean Bronze Age percussive repertoire comprising a handful of Minoan seira, 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.

Abstract author(s): Loyd, 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, 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 Hellenistic, Corinthian, East Greek and more. By viewing these iconographies as part of a pan-Hellenic tradition, but also in reference to local traditions to object and image, regional Greek black-figure pottery shows us a subtly variegated pallette 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 forms of trade, and because of this are useful sources for the reconstruction of ancient socio-economic networks – to what extent might these vessels 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 varied nature of ancient Greek music, the shared features which unified it, and the local traditions which differentiated it.

Abstract author(s): Vondiki, 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 paintings 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 in a few works of the Painter of Louvre K240, who started his career in Sicily. Some of the vessels of the latest artist comes from Lipari, where little bronze bells have been found in tombs also. These facts enable the study of relocation almost exclusively on the vases of Asteas and the Painter of Louvre K240, who started his career in Sicily.

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Music as a commodity.

Visual media analysis: musical iconography

Organological comparisons and studies

Representation of ritual music

Music networks and percussion aesthetics in iron age aegaean

Abstract author(s): Smith, Amy (University of Reading)

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, generally 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 coinages. 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 instruments. 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.

Abstract author(s): Vergara Cerqueira, Fábio (Universidade Federal de Pelotas; Institut für Klassische Archäologie - Universität Heidelberg; Centre Jean Bérard - Nantes; Humboldt-Foundation; Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq Brasil - Pesquisador PQ2)

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, generally 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 coinages. 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 instruments. 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.

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SOUNDS AND SOCIAL SYNERGIES IN THE PERFORMATIVE SPACES OF THE PAST

Abstract author(s): Balila, Angela (National Research Council of Italy)

Abstract format: Oral

Research on musical and choreal performances in the sacred sphere has provided extensive documentation of human behaviour and communication 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 recognizing performative spaces as places based on their physical structures and the way musicians and dancers interacted with their audience, in those structures, can we begin to understand how sonic events and ritualised movements performed in those 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.

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EARLY AGRICULTURAL COMMUNITIES IN SOUTH-EASTERN EUROPE: NEW DISCOVERIES, INTERPRETATIONS AND MODELS

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

Organisers: Vitasovc, Selena (Institute of Archaeology, Belgrade) - Arampatzis, Christoforos (Aristotle University of Thessaloniki) - Rajković, Dragan (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-Bačka and adjacent areas 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 opportunity to advance, including archaeology; numerous large-scale development projects were undertaken in many South-European countries (motorway constructions, etc.), providing the opportunity for new research activities. Moreover, changes in theoretical and methodological approaches needed to be faced with the continuous increase 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.

1

THE TIMING, TEMPO AND MODE OF THE NEOLITHIC EXPANSION ACROSS THE CENTRAL BALKANS

Abstract author(s): Perovic, Marko (Faculty of Philosophy, University of Belgrade) - Nikolic, Mladen (Faculty of Mathematics, University of Belgrade) - Pendi, Jugoslav - Blagovješć, 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 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, showing 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 loo-troughing 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): Manić, Miroslav (Institute of Balkan Studies, Serbian Academy of Sciences and Arts) - Mirkić-Manić, Neda (Meduškotinski zavod za zaštitu spomenika kulturne subotečnosti)

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 Janjić, Sanđa and Ada municipalities on the Bačka bank of Tisa River. Among the newly discovered locations, around 90 sites could be determined as being early Neolithic, Körös-Starčevo 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 favored for settling in the early Neolithic, when compared with the opposite Barat 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 INTERFUGE

Abstract author(s): Burić, 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 resolve 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 Šarelje style around 5400/5350 BC (Marković et al. 2016; Jakuc et al. 2016; Božić et al.) and its spread towards the micro region between Đosari Miholjaci, Đakovo and Slavonjski Brod was noticed for the first time (Božić 2017; 2018). This micro region was a separation point in late Neolithic as well between Körös, Bački Starčevo and classic Starčevo styles (Roganc 2002). S. and Butnjar finds from the eponymo Bački Starčevo site (Marković, Škrošić 2002) 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 ILLUSTRATE 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-
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 Project (NCCP), an ongoing project hosted by the National and Kapodistrian University of Athens. The NCCP focuses on a number of sites, such as Ethniki (ca. 5800-5300 B.C.), Platanos (5500-5000 B.C.), and the Late Chalcolithic site of the Lissos area on the island of Crete. 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 significant. The new results of the Chalcolithic at Polis (Kourion) site are promising. The new data at the Chalcolithic site from Paliagkion (Limassol) area will be discussed as well. At the Late Neolithic site of Kea (Sifnos), the authors report new results and discuss the implications of the new data at the site. At the Late Neolithic site of Minoa (Kreta), the authors discuss the implications of the new data at the site. At the Late Neolithic site of Minoa (Kreta), the authors discuss the implications of the new data at the site. At the Late Neolithic site of Minoa (Kreta), the authors discuss the implications of the new data at the site. At the Late Neolithic site of Minoa (Kreta), the authors discuss the implications of the new data at the site.
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): Papamani, Katerina - Vakirtzi, Sophia - Mantzourani, Elieni (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 woolen textiles were a cornerstone of Mycenaean economy. As regards earlier periods, a complex lack of written testimonies and of preserved woolen textiles from the Aegean world poses a serious challenge for the reconstruction of wool (pre)history in the region.

Zoarchaeological 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 until the Early Bronze Age (7th - 5th millennium BC) is in progress. Conventional analysis, such as reconstruction of sheep body condition 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 zoarchaeological 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 DRAGOŠENI (ROMANIA)

Abstract author(s): Margarit, Monica (Vasile University of Targovişte: "Vasile Parvan" Institute of Archaeology, Romanian Academy) - Boroneant, Adina - Balasecu, 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. Debitage waste is rarely mentioned such studies, and sometimes not even collected during the archaeo-
elogical excavations. Our study aims to draw attention particularly 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 of debitage 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 spongs were also manufactured. In the case of antler, the bipartition method by double grooving has been most often, resulting bevelled tools mainly. In the case of archaeological assemblages composed only of finished pieces, but also of blanks, we can usually clearly identify only the longitudinal debitage method used, but given the presence of the above mentioned waste debitage we could also infer the combination of procedures involved in the debitage operation.

Acknowledgements

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H-2-1/125.10.2019).

12

BONE TECHNOLOGY IN THE LATE NEOLITHIC IN THE CENTRAL BALKANS

Abstract author(s): Vitezovic, Silvija (Institute of Archaeology, Belgrade)

Abstract format: Oral

Studies of technology in general, and in particular bone technology were for a long time 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 technol-
ogy 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 technolo-
gies. Overall, bone technology also shows high level of standardization and the presence of skillful craftsmen. 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): Amanatzis, 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 Potron) and data back from the Greek Early Neolithic (7000-6000 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 (2012-2013) unearthed a settlement that was inhabited almost uninter-
ruptedly 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, banded tools, scrapers, awls, 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 Life Long Learning in the context of the project "Reinforcement of Postdoctoral Researchers - 2nd Cycle" (MIS-5039221), 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, Dorgana (Archaeological museum Osijek) - Antolin, Suzana - Balen, Drazen - Tbiljic, Darko (Univer-
sity of Zagreb, Faculty of Science)

Abstract format: Oral

This paper will focus on the research 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 we will present an overview of the current results regarding the stone industries in the Late Neolithic, with the focus on localities in the Slavonian region, in the eastern part of the Lika 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, those 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 finds, that are necessary in provenance studies, a series of investigations has been initiated using optical, XRD- AES and ICP-MS methods of analysis.

15

SOURCING OF OBSIDIAN ARTIFACTS FROM PREHISTORIC SITES IN CROATIA BY PKRF

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, Slovenia, and Turkey, has 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 1996. 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 portable X-ray fluorescence (pXRF) spectrometers 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 Virovitica. But for sites in southern Croatia it was surprisingly found that Lipa1 obisidian comprises >90%, while small numbers from Palaspol and Malos (<1%). These results strongly suggest that maritime trade, both from the original acquisition of the obsidian from these two islands, and likely also along the Adriatic Sea, was easier and more frequent than travel southward over the mountainous Dinari Arc.

a. THE BEGINNING OF THE EARLY COPPER AGE IN THE MIDDLE STRUMA VALLEY: TWO SITES IN SOUTHWEST BULGARIA

Abstract author(s): Katsarov, Georg (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 Southeastern Bulgaria – Mostonitsa-Chukata and Strumitsa – Kaynarska Chuka. Both sites are located at the riparian’s highest points opposite to one another, on the left and right bank of Struma River, in the south 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 Kisna 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 Mostonitsa and Strumitsa locality to the west 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 eastern part of the Middle Struma valley. The analogous 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): Ridgeway, William (University of Illinois at Chicago)

Abstract format: Poster

The Bedřovská strata culture of the Middle Copper Age has long been distinguished for its numerous large cemeteries and camping 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 (Hunyadihalm 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 Boládási/Bádeni 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, Bedřovská strata, and Hunyadihalm culture) relate to each other chronologically and socially? I draw from the robust data sets provided in the Magyarország Régészeti Topográfiája (Archaeological Topography of Hungary) volumes and my own field research in Eastern Hungary, as well as synthesizing available data from around the region.

On the very specific focus has been 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 observed throughout Southeastern Europe during the late 6th and 4th millennia BCE.

c. SMALL SHEEP OF THE MARSHES: REDUCED LIVESTOCK BODY SIZE IN THE SOUTHERN CARPATHIAN BASIN COPPER AGE

Abstract author(s): Tomazec, 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, archaeological evidence of marshland exploitation has been in part. 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 Podškolj, Northern Serbia. 398 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 zoosexecological 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 SOUTHERN TRANSYLAVANIA (ROMANIA): ANIMALS REMAINS AND PHYTOITHS FROM THE EARLY NEOLITHIC SITE OF SOMUSI – TELEGI

Abstract author(s): Milea, Daniel (Faculty of Biology, Alexandru Ioan Cuza University of Iaşi) - Danu, Mihaela (Faculty of Biology, Alexandru Ioan Cuza University of Iaşi) - Bejenaru, Luminiţa (Faculty of Biology, Alexandru Ioan Cuza University of Iaşi; Romanian Academy - Iaşi Branch, “Oglinză Noastră” Center of Anthropological Research)

Abstract format: Poster

The Neolithic communities in southern 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 new settlements in the southwestern Transylvania, from interdisciplinary perspective, valuing archaeologically and archeobotanically the Starčevo-Cris sites ofSomus-Telyjeh (Hunedoara County, Romania), dated to 7th – 6th millennium BC. The animals remains and phytoliths offers information on the settlement palaeoeconomy and palaeoenvironment. 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 polecats (Mustela polecatus). 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 DENTRITIC forms, deriving from the inflorescences or the husk of grasses, are quite well represented (over 25%). These phytoliths are most likely indicative of cultivated crops 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 fossils. 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, north 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 and culturally rich 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. Yet, while working bone can so often perform a significant 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 all described. A glimpse of worked animal bone collection at this geographical and cultural cross-roads. 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.

391 PREHISTORY, ARCHAEOLOGY AND ARCHAEOLOGISTS AS REFLECTED IN SCHOOL BOOKS AND CURRICULA

Theme: 5. Sustainable archaeology and heritage in an unsustainable world

Organisers: Bozoki Emőny, Katalin (Government Office of the Capital City Budapest, Heritage Department) - Demole, Jean-Paul (Institut Universitaire de France & Université de Paris I) - Pateika, Michał (Faculty of Archaeology Adam Mickiewicz University)

Format: Regular session

The presence and dominant images of prehistory, archaeologists and archaelogical heritage in school books (written for children between the ages of 5 to 18) is a topic we have all discussed. It seems to be of crucial importance to us. It is very interesting to see and study the materials and the way the very ways of 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 social role 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 between the ages of 5 to 18 and curricula;
- the indication of mythical and distorted perceptions of various aspects of the distant past – a.e. national myths, gen-
• 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;
• measures undertaken by our research team to contribute to change the present situation (work with teachers).

SONGS OF THE LAND: STORYTELLING, PREHISTORY AND IDENTITY IN WELSH EDUCATION

Abstract author(s): Foreman, Penelope (Chwedyr 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 “Your Purpose, ethical and healthy” to be ambitious, enterprising and 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 an ethical, ambitious and enterprising attitude?

THE PREHISTORY, AN ANALYSIS OF SPANISH CURRICULA FROM A GENDER PERSPECTIVE

Abstract author(s): Schich, Andrea (University of Vigo, GEAAAT)

Abstract format: Oral

Within the framework of Public Archaeology 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 will be a social situation 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 management. In short, a discriminatory and simplistic discourse that is based on a fictitious cultural heritage marked by

d stereotyping, ethnic biases;
• 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;
• measures undertaken by our research team to contribute to change the present situation (work with teachers).
great subjectivity and false accumulated objectivity.

**THE MALE PAST: PREHISTORY IN FINNISH PRIMARY SCHOOL TEXTBOOKS**

**Abstract author(s):** Aalto, Iari - Kemppainen, Lauri (University of Turku) Gheorghiade, Paula (University of Toronto) - Buckingham, Emma (University of Missouri) - Paulsen, Charlotte (Museum Skanderborg)

**Abstract format:** Oral

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 and cultural 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.

**THE PERCEPTION OF ARCHAEOLOGY AND ARCHAEOLOGISTS AMONG PRE-SCHOOL AND SCHOOL CHILDREN IN A SMALL AGRICULTURAL COMMUNE OF GRANOWO, POLAND**

**Abstract author(s):** Pawlak, Michał - Rybarczyk, Anna (Adam Mickiewicz University)

**Abstract format:** Oral

The aim of this presentation is to present results of surveys conducted among pre-school and school children (aged 9-14) 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. The survey research was conducted in two waves: in two preschool units in Granowo and Bielawy in a period between 2018 and 2019. It had a form of questionnaires given to the kids. In sum, 69 respondents answered to two 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, the archaeological and the popular culture, curiosity of archaeology, as well as professional tasks, clothing the and the place where they work. Results of undertaking research have proven that among children an image of archaeologists and the discipline itself is positive and accurate but it partially 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.

**SUPPORTING TEACHING INCORPORATES ARCHAEOLOGY INTO SCHOOL CURRICULUM**

**Abstract author(s):** Pulsen, Charlotte (Museum Skanderborg)

**Abstract format:** Oral

During the last ten years, Museum Skanderborg has offered a variety of learning sessions to the local primary and secondary schools. Six of the most popular sessions are based on archaeological excavation 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 artifacts to support and develop shared identity of the children and make them feel part of history.

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.

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 there is a waiting list. Archaeology is quite popular. 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.

2 AN INFORMATION THEORETIC APPROACH TO MYCENEAN POTTERY DATASETS

Abstract author(s): Price, Henry (Imperial College London) - Gheorghia, Paula (University of Toronto) - Vasiliou-Kaite, 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 temporal and geographical properties. In this paper we use ideas from information theory to establish key attributes of a 15,701 ceramic dataset from five Dorset 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 disorders 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 artefacts 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 employ entropy as the primary metric to divide datasets into meaningful partitions. We explore what are the “meaningful” partitions that help identify those artefacts which contribute most to the classification of data at these Dorset 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 PROCESSES IN THE LBA SETTLEMENT AT STAVROS, CHALANDRISI IN WESTERN ACHAIA, GREECE

Abstract author(s): Ropoulou, Ioannis (University of Patras; Univesitat de Barcelona) - Sourd, Konstantina (Hellenic Ministry of Culture, Ephorate of Antiquities of Achaia)

Abstract format: Oral

Excavations at the LBA settlement at Stavros, Chalandrisi in Western Achaia, Greece have provided evidence of in situ metalworking, including the presence of refractory fragments of tuyeres, secondary castings, as well as some ceramic moulds unattested for such a peripheral site. The examination of the moulds by means of optical microscopy (OM), scanning electron microscopy and microanalysis (SEM/EDX), X-ray fluorescence analysis (XRF/EDX), 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 artefacts during the Mycenaean period, as well as on the already extensive use of metal workshops in this region from the Early Bronze Age onwards. This cross-sectional point of view reflects the resilience exerted by these communities in order to overcome new and maybe the most important question for the community as a network – how can we help each other dealing with all these issues?

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 (Shinek 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 Maria Cuina project ZANBA: the zooarchaeology of the Narugic 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 Narugic Culture from early 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 studies of the possibility of mapping isotope baselines in some areas.

We begin the version of a local origin doubtful.

6 MOBILITY, COLONIZATION AND RESILIENCE: TERRITORIAL DYNAMICS IN SOUTHEASTERN IBERIA BETWEEN THE LATE BRONZE AGE AND THE EARLY IRON AGE

Abstract author(s): Curtiss 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 external engravments 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 centuries earlier with incipient contacts with Atlantic and Mediterranean trade networks and the new configuration of territories. The foundation of settlements and the inauguration and organization of productive and economic local systems during the Late Bronze Age amplified the possibilities of the region and helped to explain the Phoenicians’ interest in settling on this coast. These cyclical changes are not only visible on the macro-spatial scale, but also has 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 workshops the construction of new defensive systems such as the Castellar de Liñera. 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 multiscalar approach that examines the colonial and native dynamics of local and regional mobility. This cross-sectoral 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: 6. 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.

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 employ entropy as the primary metric to divide datasets into meaningful partitions. We explore what are the “meaningful” partitions that help identify those artefacts which contribute most to the classification of data at these Dorset 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.

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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 conference want to do. 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): Venturi, Alessandro - Abbadesa, 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 archival 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 archaelogy into technical knowledge, serving construction sector, which is now rarely opposed (in this sense the Anglo-Saxon term development-led archaeology is perfectly fitting). In addition to not producing enough knowledge, archaeology risks being seen, on the one hand, as the last defense against land consume (perhaps nobel function, but certainly improper with respect to the purpose of the discipline), more often as an aspectic 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 windmills 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 archaeology, 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 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): Bui, Valerie - Fichera, Maria Grazia - Marcinelli, Maria Letizia - Negri, Antonella (MIBACT) - Gabucci, Ada - Caci, 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 n. 50/2020, 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 setting a useful and efficient, a working group made up of representatives of the Directorate-General of Archaeology, Fine Arts and Landscape (DD-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.

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 impacts on a subsurface that is already occupied by numerous other services; in a small city it can really be 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 subsid 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 subsid and not only for archaeological purposes?

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 merging (ROBIS) and GIS functions on the same web-based environment, so allowing a faster updating. A hybrid 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 area, 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 “MAPDH (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, MAPDH 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 methods will then be included in the MAPPA system improving its effectiveness.

UNEARTHING A VANEDED GREEK CITY: THE CASE OF OLD SIKYON
Abstract author(s): Möth-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 its topography and structure. In three following excavation seasons, selected structures were explored in detail 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
BRINGING THINGS INTO PERSPECTIVE - A NEW APPROACH TO UNDERSTANDING MEDIEVAL URBANIZATION OF CENTRAL SWEDEN

Abstract author(s): Kolberg, Joakim (Department of Archaeology and Ancient History)

Abstract format: Oral

The study of medieval urbanization in Sweden has 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.

EXCAVATING CEMETERIES IN AN URBAN CONTEXT – DIFFERENT CONSTRAINTS FOR DIFFERENT ISSUES

Abstract author(s): Wermuth, Ekdje - Lambertz, Aurere (Evecha; UMR 7268, Ale Marselle Univ; CNRS, EFS, ADES, Marseille)

Abstract format: Oral

Nearby 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 excavations. These constraints become more apparent when excavating parish cemeteries, as problems specific to funerary 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 archaeologists 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 Vorges: rehabilitation of a cemetery, context of monitoring works involving the excavation of water-waste networks only.
• Reims “Rue de Vauban”: rehabilitation of the eastern part of the church, context of fragmentary urban excavation, and a quantity of burials six times greater than estimated.
• Paris “Carrefour des Templiers”: excavation of a hall without destruction of the building, context of excavation in co-activity, with the archaeological supervision focusing on the Templar cemetery but not the modern parish cemetery.

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 concern 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?
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 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 just a data generation. It is transformed into a creative and speculative practice 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.

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 plausible, the uncertainty often remains unresolved. In architecture, the 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 resists such development and how to materialise it beyond its conceptual abstraction? The hybrid methodology proposed by the authors connects features of science fiction, archaeology and choreographic practices. The authors consider archaeology as acausal 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 resist 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.

THE AMBIVALENCE OF ARCHAEOLOGICAL PHANTASMS: THE MONUMENTUM ANCYRANUM AS A SPECULATIVE SPACE

Abstract author(s): Dikaya, Fahri (TED University)

Abstract format: Oral

In conventional archaeological discussions, interpretation of a space is determined by the desire to discover a meaning in archaeology. Memory of space in different periods or time dimensions are close to being related with reality 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 architec tonic 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 Rev. Basta Diivi Austin) 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 does one recognizes speculations of different periods on the past uses and identifications of the areas in which the temple was located?

ARCHAEOLOGICAL FINDS, NONPLACES AND CONSTRUCTED UNREALITIES. WHAT IF THE CLEAR EDGE AND PUBLIC.

Abstract author(s): Antoniou, Anna (University of Michigan)

Abstract format: Oral

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.

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APPROACHING THE MATERIALITIES OF SILENCE AND ABSENCE

Abstract author(s): de Vos, Julia (Aarhus University)

Abstract format: Oral

Looking for traces of Francist compression and violence at marginalized and undocumented detention centers and concentration camps based in the space, and everyday life inavelled and horror, complex 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 silence and the reality that revolved around them with their non-places and ghosts of place. The blurred lines between theory and method resulted in a sort of ‘doing’, a blend of physical engagement and theoretical reflexion in the field.

In this paper, I argue that it is not always possible to apply conventional archaeological methods to unintentional 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 engagement 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.

LATE NEANDERTHALS OF THE MIDDLE DANUBE BASIN IN CENTRAL EUROPEAN CONTEXT: CULTURAL VARIABILITY, INTERREGIONAL CONTACTS, DEVELOPMENTAL CAPACITIES [PAM]

Theme: E. 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) - Włodarczyk, 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 Interpleniiglacial (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 capacity and this cultural diversity, we will discuss the role of following:
• 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.

NEW CHRONOLOGICAL DATA ON THE LATE MIDDLE AND EARLY UPPER PALAEOLITHIC NORTH TO THE MORAVIAN GATE

Abstract author(s): Włodarczyk, Andrzej (University of Wrocław) - Moska, Piotr (Institute of Physics – Centre for Science and Education, Silesian University of Technology, Gliwice) - Bobak, Dariusz - Potończyk-Bobak, Marta (Institute of Archaeology, University of Wrocław)

Abstract format: Oral

Middle 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, a high precision luminescence method (OSL) was applied. The samples were taken from 6 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 95 ky.

Our research shows that the late Middle Palaeolithic sites should not be younger than 50–48 ky as opposed to the ELP sites, which can be dated to a period between 48–35 ky BP. Excluding dating from sites subjected to intensive post-depositional processes, this range should be limited to a few thousand years. New research did not provide data confirming that transitional industries (ELP) could have survived to the late MIS 3. This work was financially supported by the National Science Centre, Poland (grant number 2017/25/B/HS3/00292).

CIEMNA AND OBLAZOWA CAVE SITES. THE STRATIGRAPHIC FRAMEWORK OF THE CULTURAL CHANGE IN LATE MIDDLE PALAEOLITHIC

Abstract author(s): Ciosla, Magda (Institute of Archaeology Jagiellonian University) - Stefanski, Damian (Archaeological Museum in Krakow) - Valde-Nówak, Paweł (Institute of Archaeology Jagiellonian University)

Abstract format: Oral

The two archaeological sites of Ciemna Cave and Ołazowa 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 distant territories. The analysis of the use of raw materials shows, that Kraków-Częstochowa Island, where Ciemna Cave is situated, and the Podhale region, where Ołazowa 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.

VARIABILITY OF LEAF POINT INDUSTRIES IN THE CSERHÁT MOUNTAINS: RAW MATERIAL USE AND TYPOLOGY

Abstract author(s): Zandier, Krisztian (University of Szeged) - Markó, András (Hungarian National Museum) - Pantok, Attila (Independent researcher)

Abstract format: Oral

In this presentation three assemblages, documented in relatively well preserved stratigraphic sequence will be discussed. Vanyarc, Szeckésírke 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 typological reduction or the characteristic retouched forms on the other.

The assemblages are dominated by leaf shaped points (Vanyarc), side-scrapers (Galagagyörk) and end-scrapers made on thick flakes (Szeckésírke). The raw material spectra are very different ranging from the absolute dominance of regionally available rocks (Szeckésírke, 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 (Blattspitzengruppe), 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 Szeckésírke 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 (Vodrovačina, Moravský Krumlov IV) according to direct and indirect OSL dates and typology.

THE MIDDLE PALAEOLITHIC BÁBÓNYIÓN OF NORTH-EAST HUNGARY IN THE LIGHT OF THE RECENT EXCAVATION OF THE EPONYMOUS SITE AT SÁJOBÁNYÓ

Abstract author(s): Mester, Zsolt (Institute of Archaeological Sciences Eötvös Loránd University) - Salvador, Pierre-Gill (University of Lille, EA 4477 CNRS, TREV, 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 Moravian complex of Central and Eastern Europe. He named it Babónyiőn after its richest site, Sajóbányõ-Méhész-tető. Since the Bábonyian is considered as the possible ancestor of the Szeletian in Hungary. Two excavations were carried out at Sajóbányõ in 1996 and 1997. These works unearthed a rich knapped stone industry, thousands of artefacts,
embedded in a brown forest soil. This palaeosol 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 project "La 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 Évros Lozère University in Budapest, the Hungarian National Museum of History, and the University of Miskolc (Hungary). The project has various objectives which are numbered as a first quadrilateral, to improve our knowledge about the site. The new excavations from 2019 to 2024 provide new data for clarifying the chronospatial position of the industries and the role of taphonomic site formation processes, and for reconstructing the palaeo-environmental context of the human occupations. The detailed technological and typological study of the lithic assemblages, including the older collections, will be completed by use wear analyses, for reconstructing technological behaviour, cultural traditions and subsistence activities of the prehistoric human groups. Here we present the first results of the 2019–2020 excavation seasons.

5 TYPOLOGICAL AND TECHNOLOGICAL STUDY OF BIFACIAL LEAFPOINTS AND TOOLS FROM MIS 5-3 OPEN AIR SITES IN NORTHEASTERN HUNGARY

Abstract

Open air sites from the late Middle Paleolithic (MIS 5-3) excavated during the past 40 years in northern France have yielded lithic industries dominated by flake production strategies with high diversity during the Early Glacial. Bifacial tool types such as leafpoint, handaxe, bifacial scraper and hand-axes 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 westemmost 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 Neanderthal migration and importations in northern France Mousterian lithic industries during the last stages of the Middle Paleolithic.

6 GEOMETRIC MORPHOMETRICS, SHAPING AND TECHNOLOGICAL ASPECTS OF LEAFPOINTS FROM TWO EPOXYNOMOUS SITES: SAJOBABONY AND SAJOZOLT, HUNGARY

Abstract

Although commonly used to analyse 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 African in Eurasia and from the Mousterian. In addition, the method of the technological reading of knapped stone artefacts is frequently used for lithic analysis in Palaeolithic 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 Palaeolithic 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 Sajóbábony-Méhész-tető during our recent excavation and former field works by Á. Ringer and B. Adams, as well as in the Széleta 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 SZÉLETTIAN LEAFPOINTS

Abstract

The aim of the research is an investigation of Széletian leafpoint technology and function. In our studies, we applied experimental and in-use wear analyses. The investigated lithic material comes from an archaeological site in Moravany-Dlhá (By L. Zott, the K. Abáth and L. Barta). The characteristic features of the assemblage are leafpoints (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 reproduction. The first phase of the analysis was focused on the experiment. It began with an investigation of the assemblage – both preforms and flakes from this prehistoric process. Afterwards, 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 actuarial experiments connected with cutting, throwing and favoring. The next stage was a use-wear analyses 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 pointed and the character of macroscopic and microscopic traces associated with the usage and handling.

8 RE-EXAMINATION OF THE SUBALYUK NEANDERTHAL REMAINS (SUBALYUK CAVE, HUNGARY)

Abstract

The support of the Hungarian NKFIH K125561 Grant is greatly acknowledged.

Desmadryl, Thomas (University of Lille) - Feray, Philippe (INRAP) - Lamotte, Agnès - Tuffreau, Alain (University of Lille)

Abstract format: Oral

In 1992, 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 new detailed re-examination was carried out 25 years ago (Pap et al., 1996).

Next-generation sequencing (NGS) of the female individual, combined with DNA-enrichment methods and a low covered mitochondrial genome unambiguously assigning the skeleton as Homo neanderthalensis. This first palaeogenetical result from Hungarian Middle Paleolithic human remains, the palaeopathological 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 K107/16-5061 Grant is greatly acknowledged.


9 3D RECONSTRUCTION OF NEANDERTHAL CHILD’S SKULL OF SUBALYUK (HUNGARY)

Abstract

Coqueugniot, Helene (UMR 5199 PACEA - Université 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) - Tuffreau, Alain (University of Lille)

Abstract format: Oral

Paleoimagining has revolutionized archaeological sciences in general and palaeoanthropology 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 her original skull shape might have been. This approach provides new information of growing interest to the scientific community.

PSL University Paris) - Mellado, Nicolas - Barthe, Loïc (Institut de Recherche en Informatique de Toulouse, Université Toulouse III - Paul Sabatier) - Tuffreau, Alain (University of Lille) - Feray, Philippe (INRAP) - Lamotte, Agnès - Tuffreau, Alain (University of Lille) - Grużdź, Witold - Migal, Witold (State Archaeological Museum in Warsaw)

Abstract format: Oral

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10 LIPID BIOMARKERS FOR TUBERCULOSIS ARE PRESENT IN NEANDERTHAL SKELETAL REMAINS FROM SUBALYUK, HUNGARY

Abstract author(s): Minkin, David - Lea, Donna - Wu, Houdini (University of Birmingham) - Liewellyn, Gareth - Williams, Christopher (University of Swansea) - Pap, Zsóka (Hungarian Natural History Museum) - Pálfi, György (University of Szeged) - Maier, Frank - Zink, Albert - Jaeger, Heidi (EURAC)

Abstract format: Oral

Studies of two Neanderthal individuals from Subaluyk (Hungary) showed bone lesions that could be associated with tuberculosis. A young adult female had an age of 99,650-98,610 BP and a 3-4-year-old child was somewhat younger at 34,487-33,286 BP. Biomarkers, such as DNA 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 mycolic acids, profiled using gas chromatography mass spectrometry (GC-MS). The specimens analysed were sacrum and vertebrae 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 child vertebrae and cranium. In contrast, the child vertebra and cranium specimens proved clear diagnostic signals for C32 mycolic acid, accompanied by lesser amounts of the C50 component. The adult vertebra showed only a very weak index peak for C35 mycololactone and no lipid biomarkers were discernible in adult sacrum samples. The detection of C32-mycoserosate 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. Data pits in the area of Pest County (Budapest) are yielding bison metacarpals with definitive tuberculosis lesions up to at least 100ka BP, but not later than 10 – 20ka BP. Pleistocene megafauna could well have passed tuberculosis on to co-existing Neandertals.

401 IMAGE-BASED 3D-DOCUMENTATION – NEXT LEVEL OF DATA STORAGE IN DIGITAL ARCHAEOLOGY

Theme: 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 9 topics. We invite researchers of all disciplines that are working with Image-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

1 THE USE OF 3D DOCUMENTATION IN BROAD-CONTEXT STUDIES OF ARCHITECTURE ON THE EXAMPLE OF TETZCOTZINCO, MEXICO

Abstract author(s): Prusaczyk, Danilo - Juszczyk, Karolina (University of Warsaw)

Abstract format: Oral

3D documentation and modeling are now one of the basic tools for architectural 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 Tetzotzinco, 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-generated problems that archaeologists have not faced in the last decades.

The purpose of our participation in the discussion is 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 archaeology or history of architecture.

2 USE OF 3D DOCUMENTATION IN THE STUDIES OF THE ANDEAN CEREMONIAL LANDSCAPE PRE-COLUMBIAN ORACLE APU CORUPUNA

Abstract author(s): Schobczyk, Maciej (Center for Precolombian Study University of Warsaw) - Ćmielewski, Bartłomiej (Laboratory of 3D Scanning and Modeling, Wrocław University of Science and Technology) - Štimanović, Štefka (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, Felipe Guaman Poma de Ayala, Cristóbal de Acosta), authors mention the temple of Nevado Coropuna. According to our research, this place was the monumental site now known as Maucaullacta-Pampa (over 60 hectares). It was founded at an altitude of between 3,600 - 3,800 meters above sea level. Maucaullacta 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 what object but from 3 to 15MB photos, then processed in a photogrammetric project in the Agisoft Metashape program (up to 200GB) products from this are mainly orthophotos 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, mlt, jpg, models and textures up to 1GB.

Lidar documentation:
- binary files regarding the trajectory in the txt file (drone - 7MB), station on the ground 2MB, txt trajectory about 22MB;
- data from the scanner in the .osp format, hero about 2-3GB;
- point cloud in the format: las - about 2GB

The basic storage disk has 1.6TB.
relevance, a common ground for storing and archiving the massive datasets produced by 3D-documentation is still missing. Asims, 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 broad 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): Hitich, Jill - Oppenhausen, Loes - Jefra, 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 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 peradata. 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 immersive 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): Fernia, Kats (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 to make 3D-documentation 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

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 97 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.

ABSTRACT 1

1 IMITATIONS OF ROMAN REPUBLICAN DENARI FROM THE NATIONAL ARCHAEOLOGICAL MUSEUM IN SOFIA, BULGARIA

Abstract author(s): Dzikova, 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 97 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 tetradrachm and Constantinian dynasty is clearly recognizable, but their lunate and stellar reverses are truly parvenu, their closed 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): Myczynski, Kryyo - Dymowski, Arkadiusz - Bursche, Aleksander (University of Warsaw)

Abstract format: Oral

Roman Imperial denarii are abundantly found in the area of Barbacium. 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 are 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 Chyernykhvyl' culture. This is only one region in Barbacium, where finds of such kind of denarii have been recorded in thousands. Furthermore, it is interesting that remains of workshops dealing with casting of coins of a Nerva-Antonine type 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 Barbacium.

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 influx of Imperial Roman auxes which 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 lies 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-Julian coins – correspond to the value of contemporary genuine Roman gold coins. The origin and functions of these 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 also been 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 SCEATAS 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 Ribe, South western Denmark. More than 280 sceattas, hereby 225 WV, have been excavated as single finds in stratified layers, since the 1970’s. 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 UHNat, Aarhus University, and Museum of Southern Jutland, a completely new aspect came to light a few clay moulds from forgery (?) 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 to what purpose?

6

ISLAMIC COINS (7TH-BLTH-CENTURIES) FROM THE EARLY MEDIEVAL SITES OF AZERBAIJAN

Abstract author(s): Sedyov, Abbas (UNEC Azerbaijan; Azerbaijan National Academy of Sciences) - Ibrahimov, Kamil ("Tcherishe-
* State Historical-Architectural Reserve

Abstract format: Oral

All societies are subject to substantial economic changes upon the appearance of money. Nominal weight, metal composition, leg- ends 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 (dirhams), silver dirhams, and copper coinage 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 Sassanian drachmas. By order of the Caliph, images on coins were prohibited, instead, the coins were decorated with verses – ayat from the Koran.

7

IMITATIONS OF THE FRENCH GUÉNAR 1385-1417/21. HOW, WHERE AND WHY?

Abstract author(s): Mosegaard, 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 (1388-1422). 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 part of their 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. This 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 ordinances). 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-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): Wuggy Wolf, David (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts - ROG)

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 moulded 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 those “imitations” and their Roman originals will be considered with reference to concepts such as appropriation, transformation and cultural translation.

405

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 5564-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 the adaptive 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 moulded 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 those “imitations” and their Roman originals will be considered with reference to concepts such as appropriation, transformation and cultural translation.

405

ARCHAEOLOGICAL 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 5564-ISEM, CNRS, Université de Montpellier)
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ARCHAEOLOGICAL PERSPECTIVES ON SOCIAL CHANGE DURING THE MIDDLE AGES

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1 MORPHOLOGIC AND ARCHAEOZOOLOGICAL EVIDENCES OF LIVESTOCK EVOLUTIONS IN LANGUEDOC DURING THE TRANSITION FROM LATE ANTIQUITY TO EARLY MIDDLE AGES

Abstract author(s): Mureau, Opyrien (Université Bourgogne Franche-Comté) - Forest, Veninny (Inrap) - Massendari, Julie (HADES)
Abstract format: Oral

This enquiry is an ongoing PhD research on an extensive, updated state of archaeological documentation about food habits and animal husbandry in Mediterranean Gaul from the 4th to 11th c. Numerous sites were recently discovered thanks to the development of an archeological survey in the Languedoc plain during the last decade. This survey 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 BMI. Sheep and goats seem to gain importance and the slightly increasing frequencies of young caprines imply that they were more intensively bred for meat, while the proportion of cows 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 goat 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 criteria, 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 RESOURCES CONSUMPTION IN SOUTH FRANCE DURING MEDIEVAL VILLAGE GENESIS

Abstract author(s): Mor, Léa (Aix Marseille Univ, CNRS, Minest 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 9-13th 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. Past 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 BIOARCHEAEOLOGICAL APPROACH TO MEDIEVAL AGRARIAN SOILS FROM ATLANTIC EUROPE (ASTURIAS, NW SPAIN)

Abstract author(s): Fernández Fernández, Jesús - Moshenika, Gabrielle (University College London) - Martín Seijo, María (Universidad 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. 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. 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. 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-

4 AN INTERDISCIPLINARY ANALYSIS OF THE IMPACT OF THE BLACK DEATH ON THE POPULATION OF MEDIEVAL CAMBRIDGE.

Abstract author(s): Insko, 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, Ruyun (University of Cambridge)
Abstract format: Oral

The Black Death is often viewed as a transformation in the lives of medieval peoples. The catastrophic loss of life is commonly characterized 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 biocultural 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 assesses the impact of the Black Death on the inhabitants of Cambridge. Through multidisciplinary analysis of over 800 individuals from Cambridge and its hinterland, including isotopy, proteomics, genetics, osteoarchaeology and palaeopathology, biometrics, 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): Brau-SoléGostosa, Iblia (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 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? Is 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): Gal, Erika (Institute of Archaeology, Research Centre for the Humanities) - Bartósiwicz, 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-Kőbánya in northern Hungary. The method yielded an outstanding assemblage, containing previously unseen numbers of medieval bird and fish bones. The assembly 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) is the material to the corona 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) is the material to the corona 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) is the material to the corona of its outstanding social status of its inhabitant and guests who may have been engaged in hunting.
ORGANIC RESIDUE ANALYSIS OF MEDIEVAL COOKING WARES FROM THE VILNIUS LOWER CASTLE: A Glimpse into the Castle’s Inhabitants’ Diet

Abstract authors: Rusteikyte, Aukso (Vilnius University, History Faculty, Archaeology Department) - Brown, Sophie - Evershed, Richard (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Motzataki Matzaviciute, Giedri (Vilnius University, History Faculty, Archaeology Department) - Venckunienė, 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 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 - have until now been scarcely investigated. In order to recover information about medieval ceramic vessels’ content a well-established protocol of organic residue analysis was performed and high concentrations of lipids were extracted. GC-MS, GC-FID, and GC-MS/MS are used for the quantification of fatty acids. The 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 bioarchaeological data? In this study we will present insights into the Vilnius Lower Castles’ inhabitants’ diet during the medieval times by comparing biomolecular, archaeological, zooarchaeological data and textual sources and discuss the perspectives of such research.

A HOUSEHOLD ANALYSIS FROM THE MEDIEVAL CORINTH (11TH TO 14TH CENTURIES): USE OF SPACE AND DAILY LIFE

Abstract authors: Ragkou, Katerina (Philippus 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 life of their occupants and social behavior. This paper is focusing on the architectural remains and the 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.

GENDER DIFFERENCES IN DIET AND LIFE CONDITIONS IN THE RURAL MUSLIM POPULATION OF LA TORRELLA (GRANADA, SPAIN 13TH-14TH CENTURY AD)

Abstract authors: Loffranceschi, 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=979) from Torrelora (Areas del Rey, Granada, Spain -13th/14th centuries AD). To this aim, we analyse a suite of variables including δ13C and δ15N 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 adult 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 δ13C or δ15N, 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.

Taking together: data on stable isotopes, enamel hypoplasia, and cribra orbitalia point to a lack of differences in diet and health between sexes at Torrelora, while long bone 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.

AGRICULTURE PRACTICES IN BORDER AREAS: ARCHEOBOTANICAL ANALYSIS FROM THE EARLY MEDIEVAL RURAL SETTLEMENT OF SENHORA DO BARROCAL (WESTERN IBERIA)

Abstract authors: Seabra, Luis (InBio-Research Network in Biodiversity and Evolutionary Biology/CIBIO- Research Center in Biodiversity and Genetic Resources - Faculty of Sciences/University of Porto) - Toraño, Joxe (Institute of Prehistory, in Biodiversity and Evolutionary Biology/CIBIO- Research Center in Biodiversity and Genetic Resources - Faculty of Sciences/University of Porto; Centre for Archaeology, UNARQ, School of Arts and Humanities. University of Lisbon, MHIC - UP - Natural History Museum of the University of Porto) - Tant, 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 disputes, creating ever changing border areas where settlement and economic activities may have assumed particular forms. Central Portugal is one of these 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 tros. 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 archeobotanical 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/trig)os), 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 oilseed plants were also recovered. The predominance of undamaged 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 archeobotanical analysis 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.

THE WILD NORTHEAST. IDENTITIES IN COEXISTENCE IN THE UPPER FRONIER OF AL-ANDALUS

Abstract authors: Bruñ, Jesús - Olive-Busom, Júlia (University Autonoma of Barcelona) - González, Ángela (Universitat de Lleida)

Abstract format: Oral

The archeological Upper frontier of Al-Andalus is defined by a lack of chronological 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 protection of its population, whilst Santa Coloma d’Ager consisted on a Christian burial space that was continuously used from the 5th century, slightly more recent than the Senhora do Barrocal occupation. Therefore, the development of archeobotanical 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.

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 biodiasnce analyses we aim to ascertain if these two populations led completely separate paths or if, geographically, ecologically or even genic closeness led them to similar strategies.
Oral Poster - Poster
Brami, Maxime (Palaeogenetics Group, Johannes Gutenberg University Mainz) - Emra, Stephanie (University of Vet

This talk offers a brief overview of the social and resource sequence of burials in town and country from the 6th century to the 12th, focusing 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 un
documented people in historical periods variously signal their identity, status, rank, sex, age, health, diet and origin over some 700 years.

Diet in medieval Sicily through time and space: an isotopic approach
Abstract authors: Alexandre, Michelle - Ugli, Alice (BrixCo, 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 6th century AD and the 11th 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 isotopic 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 diet 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 iso
topic analysis of collagen amino acids (CSIA-AAA) via GC-O-RIMS. This technique, only recently being applied to archaeological popula
tions, offers better resolution in animal and human diets, particularly in circumstances where consumption of Mediterranean fish is dif
cult to disentangle.
This research forms part of the collaborative EU-funded project Sicily in Transition (SICITRANSIT, York, Rome, Lecce) which aims to understand the social and demographic changes that occurred through successive periods of Byzantine, Arab, Norman and Swabian rule in Sicily.

Carbon and nitrogen stable isotope analysis on stored crops from early medieval village of Miranduolo (Siena, Italy)
Abstract authors(s): Collella, Miranacconetta - Colè, Paula (University of Salento, Laboratory of Archeobotany and Paleoeology)
- De Benedetto, Giuseppe - Pennetta, Antonia (University of Salento, Laboratory of Analytical and Isotopic Mass Spectrometry) - Primavera, Milena (University of Salento, Laboratory of Archeobotany and Paleoeology) - Valenti, Marco (Department of Histori
cal Sciences and Cultural Heritage, University of Siena) - Fiorentini, Giuliano (University of Salento, Laboratory of Archeobotany and Paleoeology)
Abstract format: Poster
Miranduolo (Chiusdino, Siena) is a 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 archaeological and biochemical investigations. In particular the storage units studied in reference to plant macro-remains and their isotopic value are a) the warehouse (S96S) of the farmer blacksmith, one of the relevant figures in the village, which is lo
cated on the upper terrace b) three connected granaries, belonging to a large storage area (S911) situated on the south terrace c) the granary of a peasant hut (C34), located in the southern part of the village. The archeobotanical 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 high
lighted by archeological 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 OSTEARCHAEOLOGICAL APPROACH
Abstract authors(s): Vasilie, 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 cities, covering the period between the 10th and the 16th 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 pachomian invasion and migration, the attacks of the cuman, the invasion of the tatars) or even its existence (the Aghaezli rebellion and the rise of the Voah 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, occu
pies an important place. This field brings significant contributions, which is reflected in a wide range of biological indicators that ex
press 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 funerary 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), Nuţuşi (Tulcea County) and Păciuļi (Constanta County).

THE PRECARITAT IN ARCHAEOLOGY [ECA]
Theme: 7. 25 years after: The changing world and EAA’s impact since the 1995 EAA Annual Meeting in Santiago
Organisers: Brama, Massimo (Palaeogenetics Group, Johannes Gutenberg University Mainz) - Emer, Stephanie (University of Vit
ernary Medicine Vienna, Anatomy) - Malagù, Aldo (Monopoli, Römisch-Germanisches Zentralabteilung) - Muller, Antoine (The In
stitute 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 opportu
nities facing early career researchers in archaeology, here defined as the ‘precaritart of archaeology’. Objectives:
• To examine the shared experiences and challenges, both positive and negative, that early career researchers in archae
ology have long faced.
• 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-be
ing, 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: 2. Networks, networking, communication: archaeology of interactions
Organisers: Lewis, Carena (University of Lincoln) - Chavarria, Alexandra (Universidade de Padova) - Marciniak, Arkadiusz (Adam Mickiewicz University in Poznan) - Fernández Fernández, Jesús (University of Oviedo) - Gökliikiewicz Downer, Abigail (University of Chester)
Format: Regular session
EAA’s 2019 roundtable developing a MERCo-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 bet
ter-informed public with a more nuanced understanding of medieval history and archaeology would help 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 public archaeology is taught, learned or otherwise encountered in schools and the impact of this on subsequent attitudes.
This session welcomes papers that present, review 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?

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 bring 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 (ArchaeoPublic, Association for preservation and research on Castile Riem am Riedberg)
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 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 refurnished 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 Castile Riem am Riedberg”, 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): Schino, 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) shows the educational aims of each institute outside of this 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): Dutta Leivas, Ivonne (Linnaeus 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 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 paper serves as an introduction to how archaeological outreach 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 “vorkanty or involuntary” the fact that the landscape is a cultural product built by the passage over the centuries. In this way, problematic aspects associated with the fact that landscape and those social groups are also such that 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
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.

DIGITAL POTTERY ARCHIVES: NEW METHODS OF DATA USE AND CLASSIFICATION

Theme: Sustainable archaeology and heritage in an unsustainable world

Organisers: Gattiglia, Gabriele (University of Pisa) • Wright, Holly (AOS - 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 in print format and can be difficult to obtain (especially for professionals or people without a physical access to libraries or library resources). Furthermore, the availability of digital imagery (e.g. images) may allow the application of new methods in archaeology, 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 the 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 thesaurus. A common vision may still be missing, and meaning data can not be 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 and the 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.

COPTICE. COPTIC CERAMICS: AN OPEN ACCESS CORPUS OF BYZANTINE EGYPTIAN POTTERY. TOWARDS A UNIVERSAL CLASSIFICATION SYSTEM

Abstract author(s): Incardona, Baria (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 Egyptianological 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 digitize the ceramic material stored in the Manqabad ceramic collection. Oxford, Cambridge, Leiden, Bristol, Athens, Leningrad, Turin, Florence, Berlin, Frankfurt, Paris, Orikana, Marseille, Toronto, will, through the definition of a uniform and generally accepted classification system. The impact of this work could be traced in the chance to identify known provenance 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 multi-disciplinary approach to the study of provenance and production technologies 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.

THE AFTERLIFE OF ERRORS. DEALING WITH DIGITIZED POTTERY CATALOGUES

Abstract author(s): Rembert, Laura (Austrian Archaeological Institute of the Austrian Academy of Sciences) • Hoß, Steksul (Nicola 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/Asyut Egypt. The large quantity of diagnostic pottery fragments (16,000 diagnostic fragments) were documented in two legacy databases and were 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, underlyings assumptions and our work processes. It also led us 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.

CREATING AN OPEN-ACCESS DIGITAL REPOSITORY OF ARCHAEOLOGICAL AND EXPERIMENTAL CERAMICS. THE TRACING THE POTTER’S WHEEL APPROACH

Abstract author(s): Hatton, Jef • Jaffra, Caroline • Ogenhaff, 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 architectural 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 para-data. 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 fail into obsolescence.

This paper discusses the practical hurdles which have been faced and surmounted of the course of the TPW project. The presentation covers aspects of archiving which are specific to the problems we encountered. 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 carries 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.

PROCESSING LARGE CERAMIC ASSEMBLAGES USING LASER PROFILING AND AUTOMATED SHAPE MATCHING

Abstract author(s): Demjan, Petr (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
COMPARING SANTA NTEANA DE MURES – CERNJACHOV 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 Santa de Mures – Cernjachov (SMC) pottery, based on available printed material. The SMC 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 area coincides with the massive Hunnic migration during the late 4th century AD. 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 database. 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 (Mihălăşeni (1034 vessels), Barlad – Valea Seacă (635) and Targovul (254)). These 3 burial grounds cover the whole SMC 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 used for the calculation of the dissimilarity of the two sites.

AI: ABDOMINABLE INTELLIGENCE OR THE FUTURE OF ARCHAEOLOGICAL INVESTIGATION?

Abstract author(s): van Helden, Daniel – Núñez Jareño, Santos – Allison, Penelope – Yukić, 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-V1can 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 recognize the different typological categories and record them. This could potential save time and funds, not least because recording on these devices is carried out by non-specialists, freeing up specialist time for more interesting analyses.

This paper outlines the design process, data gathering as well as the important concomitant research-ethical questions that come with research and archaeological work using AI technology.

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.

THREE CASE STUDIES TO TEST THE DIGITIZATION PROCESS OF POTTERY AND THE IMPORTANCE OF THE COLLABORATIVE APPROACH

Abstract author(s): Baloni, 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 stadia of analysis, useful to stress the potentiality of ArchAIDE module at every stage. The digital acquisition will be test in the project of restoration and valorisation of Silvestri-Rovali 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 Fabbratica 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.

DEVELOPMENT OF A SIMPLIFIED DATABASE OF ANCIENT POTTERY FRAGMENTS

Abstract author(s): Makino, Kuni (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 Helenistic pottery sherds discovered at the ancient site of Ein Giev in Israel and revisited recently (Makino 2018).

Known as POSTHEL, 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 development of this database, however, seems to be difficult to materialise, as scholars seem to depend only on their own database, net 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): Trouvé Alloupaz, Esther (Universitat de Barcelona) - Vicens Terré, 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, Con-structed 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 dissemina-tion. 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 underlying data modelling in order to discuss its potential as a multi-purpose resource, and gathering some feedback for application enhancement.


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 monograph in previous and subsequent catalogues, 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 classification. 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.
TACKLING THE UNCERTAINTIES SPATIO-TEMPORAL MODELLING OF ECONOMIC RELATIONSHIPS ON THE DUTCH ROMAN FRONTIER: ARTIFACT USE FOR TIME SERIES ANALYSIS

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 done to the level of individual finds (http://comparativeurbanism.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 whole 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.

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 aoric modelling and statistical 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 preferences 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, neutrality), 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 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 we 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.

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 in 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 romantics 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.

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 we 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. A STUDY OF THE CENTURIES-LONG RELIANCE ON LOCAL CERAMICS IN JERASH THROUGH FULL QUANTIFICATION AND SIMULATION

Abstract author(s): Romanowska, Iza (Barcelona Supercomputing Centre) - Brughmans, Tom - Raja, Rubina (Aarhus University) - Lichtenberger, Achim (University of Münster) - Carrignon, Simon (University of Tennesse) - Bes, Philip (Independent Researcher) - Egelund, Lina (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 preferences 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, neutrality), 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 assemblies, such as pottery found at archaeologi- cal sites, and to understand what kind of processes might have driven the trends in economic activity over centuries.

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 compu- tational 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: exploratory interactive introductions to basic concepts, guidelines to best practice in computational modelling, practical tutorials for getting hands-on experience with some of the meth- ods, and a model library of key concepts and processes that can be used to create your own models.
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 to access 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): Bluszczyk, Karolina (University of Warsaw)
Abstract format: Oral
In this 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. Microsopic observation enables identification of the species and topographic characteristics 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 Silesian 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, Anna (University of Northampton) - Stacey, Rebecca (The British Museum)
Abstract format: Oral
And 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 uncontracted by addition of modern polymers, which sometimes complicate or prevent scientific study.

Prevention 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-sol, mineral or vegetable tanning) used, were also influenced by the and 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.

LEATHER SHOES IN EARLY DANISH CITIES: CHOICES OF ANIMAL RESOURCES AND SPECIALISATION OF CRAFTS IN VIKING AND MEDIEVAL DENMARK
Abstract author(s): Brandt, Luisa (GLOBAL Institute) - Hasse, Kirstina - Ebsen, Jann (Odense By Museer)
Abstract format: Oral
This paper presents the findings of the minimally destructive biomolecular species identification method known as ZooMS (zooarchaeology - mass spectrometry). It will make use of mixed collections of animal parts used as resources for manufacturing leather 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 be prospective leather finds and hold excellent potential for exploring past animal resource exploitation and preferences of skin for a variety of purposes.

ARCHAEOLOGICAL LEATHER DEGRADATION: AN EXPERIMENTAL APPROACH USING ATR-FTIR, MICRODISC, 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, ICIPI Branch, Romania; Department of Chemistry, Faculty of Sciences, University of Craiova) - Carstens, Cristina (Center for Research and Physical and Chemical Biological Investigations, National Museum of Romanian History) - Sandras, Claudiu (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICIPI Branch) - Proietti, Noemi - Di Tullio, Valeria ("Sagrè-Capristo" 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, tanned, 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 DISC, solid state and unilateral NMR spectroscopy was applied to identify different tannin families (condensed and hydroxylizable) or aluminium salts used in archaeological leather. Furthermore, archaeological leather deterioration with special focus on collagen gelatination was investigated. The strength of our approach is 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 DISC analysis is a bulk micro-destructive technique which allows us to quantify the collagen populations with distinct hydrothermal stability and characterizes 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.

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, ICPIDivision) - Carpôto, Cristina (Center for Research and Physical and Chemical Biological Investigations, National Museum of Romanian History) - Plăsenescu, Simona Maria - Carisela, Iulia Maria - Miș, Lucrăția (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICPIDivision) - Badea, Elena (Advanced Research for Cultural Heritage Group - ARCH Lab, National Research & Development Institute for Textiles and Leather, ICPIDivision; Department of Chemistry, Faculty of Sciences, University of Craiova)
Abstract format: Oral
Materials, whether natural or created by humans, sooner or later undergo alterations as a consequence of interactions between their structure and environment. In case of archaeological leather, deterioration depends on the different type of wind 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.
6 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, textiles, 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, was the 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 ZCLM (Zoological Characterization by Mass Spectrometry). Using this methodology in conjunction with Cross-cut use with microscopy has allowed for a broader analysis of raw 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 expect to receive and what we now have from the data obtained by traditional and scientific methods.

7 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 stress the importance of both wild and domestic animal resources for clothing production – including felt, 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 manner 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.

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 physical community and the surrounding environment. Resulting changes in social development, hunting practices, animal husbandry, belief systems and fashion...

8 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 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 chaine operatoire. In this paper, I will present the results of ethnoarchaeological fieldwork focusing on 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 deal from the Mongolian Altai.

423 SO WHAT? HOW TO GENTLY KILL YOUR DARLINGS OR HOW TO COMMUNICATE TO AN AUDIENCE AS WIDE AS POSSIBLE

Theme: S. 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 visitor just by being there. Still, the main objective is to bridge the gap between 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.
truth—but we aren’t constrained to tell that truth in a boring way. Science, with its highest aim of conveying fact, is constrained to tell the
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,
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
Storytelling, and related aspects such as meaning-making and narrative, are extremely difficult to specify. This especially holds true
understanding of communication at archaeological sites is based on a “knowing” expert, an archaeologist or
An archaelogy is storytelling. Yet, it’s an academic discipline, but at its core, archaeology tells stories about the past. This is especially
A GOOD STORY NEVER DIES. AN EXPLORATION OF STORYTELLING UTILISATION IN PUBLIC
Understanding of archaeological site as a peculiar museum space is rooted into cultural heritage researches mindset for ages. The
ON THE GRAND TOUR. These privileged visitors, personally guided by the director of the excavation, had a comprehensive preexisting
WHAT THE SCIENCE OF STORYTELLING CAN TEACH ARCHAEOLOGY
This paper is from the perspective of a novelist who is also an archaeologist. It draws on recent research in the seemingly dispa-
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.
NO GOLD, NO DINOSAURS... - AND NO, I HAVE NEVER BEEN TO EGYPT. FIGHTING Clichés ON A DAILY BASIS
A team of directly involved project members and multidisciplinary experts come up with ideas. A second team is responsible for p
Archaeological outreach in the Netherlands
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.
HOW TO GET A FEEL FOR THE PALEOLITHIC: MUSEUM OF THE STONE AGE IN THE GARAGE.

Abstract author(s): Sevastyanov, Nikolay - Margarita, Khokhina (Saint Petersburg State University) - Direktorenko, Anastasia (Saint Petersburg Academy of Fine Arts) - Korneva, Tatiana (Institute of Archaeology of Russian Academy of Sciences) - Abra- pulova, Elena (European University at Saint Petersburg) - Ashkhmin, Alseyw (Saint Petersburg State University) - Hritskaya, 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 "timalines" used in schools in history classes.

However, in addition to color coding, there are other ways in memorization to 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.

ARCHEOLOGY AS AN AGENT OF PERSONAL AND SOCIAL DEVELOPMENT. THE PEDAGOGICAL WORKSHOP IN TONOBOGRA AND THE PRIMARY SCHOOL OF ARCHAEOLOGY

Abstract author(s): Nunes, Susana - Pinto, Dulcinaísa (EPA)

Abstract format: Oral

Teaching Archaeology at a vocational, secondary, pre-Graduate level in Tongobriga (Northern 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 Feia, 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 archaeology 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 habitual 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. The exhibition is an extension of the workshop that allows to know all aspects 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.

LA BAGIOLA AND THE AREA DEL TUFO: A NETWORKING PROJECT FOR PUBLIC ENGAGEMENT IN RURAL AREAS

Abstract author(s): Solà, Guilà (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 Bagiola” 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 Bagiola Winery, owner of the land where the site is located.

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 coccopestro technique in winemaking.

The successful experiment of La Bagiola 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.

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 for 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 fieldwork. 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 – Funktionssättar, Tillgänglighet, Upptäcksarbetsarkologi (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 integral part of the 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.

INCLUSIVE APP GAME ON NEANDERTHALS

Abstract author(s): Rietveld, 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 “NiMuse” (2019-2021) is to create an audio- and tactile-focused 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 we 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.

IMPORTANCE OF CULTURE-SPECIFIC MEANINGS OF TERMINOLOGY IN COMMUNITY-BASED STUDIES

Abstract author(s): Valman, Nurcan (Nijmegen 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 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 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 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 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 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 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 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 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 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 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 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 which is derived from various statements, agreements of UNESCO, ICOM, ICOMOS and scientific articles in which the majority has been written in European languages.
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RE-MAKING THE CELTS
Abstract author(s): Collins, John (Dopt 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 loath to abandon it, especially when taking of ‘La Sine Art’. For me it is not simply a change of nomenclature but also of paradigm. Typically the greatest resistance to change comes from the scholars in this field who 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 thus the way they have been misunderstood, or, in the case of the 1990s, 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 snapity titles and concepts are preferred, in some cases even when the presenters 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.

3
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) - Elliaopoulos, Demetrios (Ionian University)
Abstract format: Poster
A various problem that archaeologist 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 the capability and opportunity of visitors to interpret prehistorically 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 visual 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.

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GENDER AND ARCHAEOLOGY FOR NON-SPECIALIST AUDIENCES [AGE]
Theme: 3. Sustainable archaeology and heritage in an unsustainable world
Organisers: Masiera-Esquerra, Clara (Universitat Autonoma de Barcelona - UAB) - Dempsey, Karen (National University of Ireland - NUl) - Martín, Ana Cristina (IHC-University of Évora; Uniarq - University of Lisbon) - Angliker, Erica (University of Zurich)
Abstract 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 seeing, 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.

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 primary 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): Heising, 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 aesthetic 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. Findings and finds 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 a room for alternative interpretations. The fundamental question therefore arises as to whether the diorama as an instrument is an integral part in archaeological exhibitions. Are they, as dusty showcases, possibly long outdated by digital media exhibits? 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.

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 researchers from across the UK and Ireland to jointly discuss approaches to gendered interpretation in curating the National 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 communing gender.

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 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 men 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...
ever, it is essential to understand how it is formed and what kind of society it promotes. The projected image of women is not only that of the past, but also that of the future, as a female hologram, in a dystopian future.

Archaeologists and historians must be aware of this scenario, not just to establish appropriate strategies in the process of communication, but also to objectively the meaning of our own job.

5 IMAGE, MEMORY AND EMOTION: GENDER AND ARCHAEOLOGY FOR NON-SPECIALIST-AUDIENCE IN PORTUGAL

Abstract author(s): Martins, Ana Cristina (IHC - pólo Universidade da Évora; Uniagro - 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 45 years of democracy, as anti-feminist narratives are still prevailing. Even a superficial analysis of archaeological activity in Portugal argues that not much has having been done from an educational 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 schoolbooks to get aware of the presence/absence of eventual gender stereotypes; 4. Analyse museum exhibitions and catalogues to identify gender issues.

Additionally, 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 emotions.

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): Biertanz, Milka (Frale Universitats-Berlin)

Abstract format: Oral

15 years ago four Neolithic graves with multiple burials were excavated near the village of Eula 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 attention. Some grave goods 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 Eula graves, we now have numerous interpretations of the Eula 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 Eula 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-Esquerda, 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-epistemic roles are assumed by children, and that they imagine life in the past according to traditional and patriarchal roles.

Taking into account gender perspective, and for the work to the coeducation, we have developed a series of workshops for pre and 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: animals, 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.

426 MEDEVIAL 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) - Szocs, Peter (County Museum Satu Mare) - Dumitrescu, Marianné (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 a 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 lasting efforts of the urban community, 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 those contacts create a solid background for establishing direct links between the town’s parish churches, their architectural and artistic features and the connected networks. 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 Brașov (Brașov/Brasov), Sibiu (Sibiu/Hermannstadt), Brașoŭ/Brno (Brno), Neustadt an der Wein (Baia Mare) and the Lvov. Similar cases from Carpathian Basin and beyond are welcome.

427 KINSHIP RELATIONSHIPS - AND WHAT THEY DON'T

The FLINTSTONES IN SAXONY-ANHALT? WHAT ADNA AND ISOTOPE ANALYSES CAN TELL US ABOUT KINSHIP RELATIONSHIPS - AND WHAT THEY DON'T

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WHEN ARCHAEOLOGY RESEARCH IS A TOOL TO UNDO GENDER STEREOTYPES IN PRE AND PRIMARY SCHOOL

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act revealed multiple original Gothic elements beneath the Baroque interventions, and after the war, the church was reconstructed in the Gothic style, with a couple of compromises and clashes of conservators’ concepts with those using the object. The restoration of the church was followed by salvage archaeological excavations, which, among other aspects, explored 404 graves dating back to different phases of the church’s history. Authors will show how architectural remains and grave finders 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 TARGOȘORU: A LINK BETWEEN NORTH AND SOUTH CARPATHIAN AREA

Abstract author(s): Magureanu, Andrei (Institute of Archaeology) - Ciupercă, Bogdan (Prahova County Museum of History and Archaeology)

Abstract format: Oral

One of the important Wallachian medieval towns, Târgșor (Prahova County, Romania) was, at a certain moment, the most involved in the commercial relations with Brașov. Due to this Târgșor 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 five saleable transports to Brașov, more than those from Clăpiștany or Târgul Nicușor. 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. These 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 BRĂȘOV-KRISTNASTADT: 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 medieval heritage from Transylvania. The church is a Gothic building built during the 14th and 15th century, and it was completed only around 1600; 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 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 asymptotic, almost twisted, the choir is built on two levels while the 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.

5 ARCHAEOLOGICAL INVESTIGATIONS AT SAINT MICHAEL’S CHURCH IN CLUJ (KOLOZSVÁR, KLAUSENBURG)

Abstract author(s): Luposz, Radu (Sapienza 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 an 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 also had 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.

6 THE ST. MARGARET’S CHURCH OF MEDIAȘ: METAMORPHOSES OF AN URBAN CHURCH

Abstract author(s): Dumitruca, Marianne (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart - Esslingen) - Istrate, Daniela Veronica ("Vasile Pârvan" 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 churches are generally of high quality, and the building is known for its valuable wall paintings. Its architectural history was influenced by the construction of the parish church of Silu, 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 accurately 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 15th 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 proposes, analyses the evolution of the church of Mediaş, and of the surrounding cemetery, laying emphasis on the value of this find for understanding the urban architecture in context of Transylvania and more widely in the Carpathian Basin.

b. THE CHURCH “ON THE HILL” OF SIGHIŞOARA

Abstract author(s): Istrate, Angel (Cultural Association Herionymus, Brașov)

Abstract format: Poster

The former parish church, called “on the Hill” of Sighişoara (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, and it was completed only around 1600; 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 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 asymptotic, almost twisted, the choir is built on two levels while the 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.

THE MEDIEVAL MINING DISTRICT: A EUROPEAN LANDSCAPE PERSPECTIVE

Theme: 2. Networks, networking, communication: archaeology of interactions

Organisers: Haggen, Georg (Archaeology, Department of Cultures, University of Helsinki) - Magnusson, Gert - Karlsson, Catarina (Järnkontoret)

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 human 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 paper 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 transport, 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, and a combination of transfer systems on land and water. Towns were founded where the traders were forced to transship metals, and a combination of transfer systems on land and water.
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 old and smaller-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 thrill or slavery was 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 (AIS). 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 systematized in about 1900 and a nomenclature was formulated around 1937. The 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 766 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 sites or in other rural areas of the region. This work is part of the response to the 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): Cembrzynska, Paweł (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 interwoven so that 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 the aspects mentioned above, i.e. archaeology, history, sociology and environmental studies. However, this interdisciplinary approach brings us to the issue of connecting methodologicals of these various 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 one 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 low 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, Catrina (Jernkontoret)

Abstract format: Oral

For 25 years the project has been compiling and analysing archaeological remains, historic sources, place names and maps in 29 mining districts with medieval origins. Within these mining areas there are archaeological remains from more than 750 medieval furnaces (with 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 capital of Sweden, is located by the rapids, where the lake meets the Baltic Sea. The introduction of industrialized mining had a crucial bearing on our medieval Scandinavian history and the urbanization of the Mälardalen 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 metal–mining 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): Bargh Nilsson, Lena (ArcMontana)

Abstract format: Oral

The project "Atlas of the Swedish mining districts" has for 25 years compiled material from 29 mining districts in Sweden, using archaeological remains, written sources, place names and historic maps. The source material have been associated with geopraphic objects and – apart from the first few years – collected in several GIS databases, with partly different structure and coordinate systems. During the period during which the different databases were established. The ongoing project "Medieval mining districts in Sweden – the essential outlands" 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.
COALING – REFLECTION ON THE ORGANIZATION OF CHARCOAL PRODUCTION DURING LATE MIDDLE AGES AND EARLY REFORMATORY TIMES IN SWEDEN

Abstract author(s): Nilsson, Olle (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 metallworks 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 “Bojplätter” 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 Hornsås ironworks, in the southeast part of Dalecarlia in Sweden, where approx. 100 charcoal kilns are estimated to have existed around the settlement.

A SHIP WRECK FOUND WITH A UNIQUE CARGO-OF OSMUND IRON

Abstract author(s): Hansson, Jim (Archaeological Research, History and Technology) - 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

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 cargos in mind. The wreck is surprisingly intact and all its cargo still in place. There is 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 were 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 a sense 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.

METALLURGICAL INVESTIGATION OF IRON BARS FROM A SWEDISH 16TH CENTURY SHIP WRECK

Abstract author(s): Hellén, Andreas (Dept. of Material Science and Engineering, Royal Institute of Technology) - Hansson, Jim (Archaeological Research, History and Technology) - 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 homogeneous and displayed carbon levels varying between 0.3 % and 0.9 %. The osmund bars contained no trace elements (i.e., no Ca, P, Sr, or Ti), 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.

THE CLIMATE IMPACT ON EUROPEAN NEOLITHIC SOCIETIES DURING THE 8.2-KY BP EVENT NEAR RIVER BASINS AND LAKES SHORES

Theme: 4. Waterscapes: archaeology and heritage of fresh waters

Organisers: Andriyovych, Marta (Institute of Archaeological Sciences, University of Bern) - Demchenko, Olya (Odesa I. I. Mechnikov National University) - Hokaze, Hirono (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 150-400 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 this period 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.

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) - Kulikova, Marianna (Herzen State University of Russia)

Abstract format: Oral

In the regions of the Northern Don-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 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 Don-Caspian (Kaschkar-Ki Bahalki), the Low Povolzhye (Algyp, Varfolomoevska), forest-steppe Povolzhye (Chakhalo, Vyuvano 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 questionable that in this time the peak of aridization has occurred here at 6200-6000 BC. Besides, some sites like Kugat, Ivanova 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 peak 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.

Gyrovezhe - A Complex Archaeological Sequence in South-Western Ukraine: Encompassing the 8200 calBP Event

Abstract author(s): Lisichyna, Kseniia (Odesa I. I. Mechnikov National University)

Abstract format: Oral

The site of Gyrozheve 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 Muychagan. The site contained materials of Late Mesolithic and Classic 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 6550-6600 calBP. Potsherds bear impressed or imprinted and could be attributed to Samshvilde style of Buh-Dnieper pottery. However, the site also yielded a group of jars associated with this culture that according to N.S. Kotova cannot be date prior to 6000 calBC. Therefore, we need to hypothesize several Pre-Neolithic habitation
at the site of Gryncheve, the first related to early comb-ornamented pottery and the latter resulting in accumulation of trowpases, a retouched canteen. These visits to site separated by 8200 cal BP 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 palaeoind of 8200 cal BP event.

3  
RAPID CLIMATIC EVENTS AND SOCIAL DYNAMICS (8200-4000 CALBP)

Abstract author(s): Kosm, Dmitry (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 paleoecological 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 colorization of the Black Sea Steppes. Attention is focused on the three historical situations during rapid climatic 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 will not discuss the controversial "migrationists' reasoning" for explanation of historical change. The very migration is a socio-phenomenon and cannot be self-explaining if even it has happened. The explanations should be formulatd 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, Olena (Odesa Ilya. Mechnikov National University; University of Bern) - Hafner, Albert (Institute of Archaeological Wissenschaften, University of Bern; Oeschger Centre for Climate Change Research)

Abstract format: Oral

The emergence of new technologies and techniques has always been one of the main issues 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 trend»? Were environmental changes that cause the 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 appearance with the spread of the Impresso Ware. But the exact period of 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 move also eastward to the Northern Pontic Region (water and/or lands). 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. B P

Abstract author(s): Andriiovych, Marta (Institute of Archaeological Sciences, University of Bern) - Hafner, Albert (Institute of Archaeological Sciences, University of Bern) - Shidykovskiy, Pavlo (Taras Shevchenko National University of Kyiv, Ukraine; Center for Paleoethnological Research, Ukraine)

Abstract format: Oral

Human groups generally react to stress situations 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 °C/~1.1 °C; the mid-Northeast 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 Odnatka 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.
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 1990s, resilience has been increasingly discussed primarily by transferring Adaptiveness 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-sidedness, 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 parameter tuning of archaeological and paleoecological data based more on the observations and implemented in the form of a formalized analytical method.

**PROXIES, PROXIES, PROXIES. DEFINING PARAMETERS FOR OPERATIONALISING RESILIENCE AND IDENTIFYING SYSTEM TRANSFORMATION IN THE PALEOLITHIC RECORD**

**Abstract author(s):** Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology; CIRC 1266 Scales of Transformation) - Bradtmöller, Marcel (Heinrich Schliemann-Institut für Altertumswissenschaft, 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 kind 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 Paleolithic record, we exemplify the use of different proxies and aim to systematise these in order to approach an operationisation of the resilience theory concept in hunter-gatherer societies and to strengthen our understanding of transformation processes in the past.

**A CLIMATE-INDUCED SETTLEMENT DECLINE AROUND 3400 BCE IN SWISS WETLAND SITES?**

**Abstract author(s):** Hinz, Marti - Heitz, Caroline (Institut für Archäologische Wissenschaften, Universität Bern) - Laabs, Julian (Institut für Ur- und Frühgeschichte, CAU Kiel)

**Abstract format:** Oral

Intra-continental 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 Adaptivity Cycle Models in Prehistoric Archaeology, we will explore an alternative, data-driven inductive bottom-up approach by treating archaeological information and paleoecological 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 far into deserted landscapes affected highly mobile agrarian societies severely but not fatally. Those populations clearly showed pronounced coupled strategies in response to these events. Diverse societies have been proposed here as being the binding 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 paleoecological time series.

**CONTINUITY OF HUMAN ACTIVITIES AND RESILIENCE**

**Abstract author(s):** Kolar, Jan (Institute of Botany of the Czech Academy of Sciences; Masaryk University) - Macek, Martin (Institut of Botany of the Czech Academy of Sciences; Charles University) - Abraham, Vojtech (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 in 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 chronology based on dendrochronology and radiocarbon dating it is obvious 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 or 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 settlements 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.

**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, we develop an argument for focusing on identifying and understanding what resilience 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-20th century to present, Merida completed two adaptive cycles. Accepting that regional urbanism is characterised by patterns of both continuity and change, it may be a falsity to question on what scale and scope ‘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.

**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 (Sundstrom and Holing 2002). Broadly speaking, the concepts associated with resilience theory offer immense potential to provide archaeological models and predictions 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; Illari 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 SHI points in the diversification history of material culture. Archaeological examples used to demonstrate this approach come from the Puabalian period in the American Southwest and the Late/Late 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 artefactual material culture, we can move away from more static cycles of resilience and infer cultural tipping points as well as cycles of growth, conservation, and reorganisation.

**MISSION IMPOSSIBLE? – 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) analyze 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 then 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:* 6. Theories and methods in archaeology: interactions between disciplines

*Organisers:* Laszlovszky, 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 instrumentalisations 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 historical archeological to ethnogenic, from cultural history to archaeogenesis, 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):* Larma Gujarro, Alma (Basque 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 archaeology 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 protohistorical symbols. I analyze the projection of the past 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 nationalism problem and the misrepresentations 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):* Hutchesson, 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 relationships with a liberal (or chauvinistic) and have political interests in aspects of the past chosen to represent national identity.

This paper looks at two queens Historiographically: Himiko and Boucidia 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 Boucidia between the British Iron Age and the Roman–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 setting 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 discourses that may be unintentionally facilitated. Do we as archaeologists have a responsibility for the creation of bateologically informed narratives and what are the political ramifications of insisting on that kind of editorial control?

**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 there 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 Bosporus Kingdom was situated on this territory, which caused a large concentration of ancient monuments there.

The Taman expedition of GAMI (State Academy for the History of Material Culture, Leningrad) under the leadership of outstanding Russian archaeologists 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, O.I. Borofskaya, 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 HMC RAS. After working with the materials of investigative cases in the Archive of the Federal Security Service, we revealed many previously unknown details about the organization of work and the future fate of archaeologists of this crucial stage for science.

**HERITAGE INDUSTRY, POST-NATION AND MATERIALITY: AN ARCHAEOLOGY OF ARCHAEOLOGY**

*Abstract author(s):* Kalenovic, 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 focusing on these aspects of uses and abuses of the past, the main focus will be on the variety 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 construction of subjectivity based on the modernist liberal consensus but rather now operate 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 - Vinjagarden, Gert Jan - Geertsema, Vita (University of Amsterdam) - Montes, Maria Camila (Amsterdam Troy Team) - Manasić, 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, political and economic paradigm shifts, 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 (most often 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. As 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 that might have been aware of, which shaped the research results on which we now build.

The site of Troy itself is perfectly suited for this study, both for its long archaeological history, as well as its position as a forerunner 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 SZÉR ARCHAEOLOGICAL SITE AND HERITAGE COMPLEX AS A CULTURAL AND POLITICAL PHENOMENA

Abstract author(s): Szabó, Dénes (Oppustaszar National Heritage Park)

Abstract format: Oral

The Szérs site was a central symbol of the 19th century Hungarian nationalism, because a medieval gazetra identified the place as the site of the first, 8th century “settlement” of the Hungarian chiefs. In the context of the Austro-Hungarian Empire, the site became the target of not just national, but scholarly interest, intertwined inseparably. Its first excavator, Benedek Gondoš, 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-Judaeistic 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 symbols, 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. Szérs transformed an important materialization of local identities as well.

How did the political usage of Szérs change with 1945., how did the socialist state reinterpret the site and the (invented) traditions surrounding 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 complex past, play in current museology, and how can it navigate between professionality, 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 discusses 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 Basílica. In the 19th century, this was a place of Benedicting contrast 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 Basílica emphasizing national integration. In the visual narratives, the rivalist 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 ARCHAEOLOGICAL

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-1960s in Turkey. An initiative of Middle East Technical University in Ankara, the Project brought together national and international experts to record archaeologically, anthropologically and historically 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 multiethnic 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 structures of Anatolia in the past as well as in the present contributing to the development of new perspectives into Turkish archaeology.

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 linked 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 Attíla Jubilee in 1938 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: 2. Networks, networking, communication: archaeology of interactions
Organisers: Dimova, Bistra (British School at Athens) - Queri, Alessandro (Soprintendenze 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 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 and computational textual analysis conducted on hundreds of newspaper articles.
ABSTRACTS

1 MID-6TH 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 6th 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 Pael in burial case, featuring ca. 600 individuals in ceramic ossuaries, attests to a genetic admix, both males and females, of 18% of Irano origin and 25% 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 ca. 6000 BCE. Loom technology wasrafted on to n-stablet, 8th-7th millennium fabric traditions in looping, twining and knotted netting. Skillshand adopted the technology and it flourished.
A fresco from Tellat (Ghassul), from a stratum dated to 4300 BCE features ritual specialists weaving 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 whorr assemblages and also a spinning wheel, an artifact type synonymous with high-grade linen yarn, were recovered from sites along the Jordan 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 alloy of local ore obtained through barter with pastoral nomads of the marginal zones and ones 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, Kallope (Centrafor 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 craftpeoples 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 typology 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, 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.

4 MOORES WHO WAS WEAVING IN THE PREHISTORIC SETTLEMENT OF KOUKONISI (LEMNOS)? PEOPLE, TOOLS AND TECHNIQUES
Abstract author(s): Bolaia, Tina (Academy of Athens)
Abstract format: Oral
The densely occupied Bronze Age settlement on the Koukonisi site (in the innermost part of Moudros bay on Lemnos) was excavated under the direction of Chr. Boulitias and the auspices of the Academy of Athens, from 1994 to 2016 with interruptions. Although the site is marked by an undisturbed sequence from the early Late Bronze Age to the early Mycenaean period, with sporadic finds of the early Mycenaean period (LH II-LH IIIA2) and a substantial phase of occupation corresponding to the developed Late Bronze Age (LH IIAB2 - LH IB 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 Kalkis’ “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-9th millennium BC 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, MUNDANE GREECE, AND PHAISTOS, CRETE
Abstract author(s): Unanowski, Agata (Institute of Archaeology, University of Warsaw)
Abstract format: Oral
A remarkable collection of casts of textile imprints from the Bronze Age Aegina is stored in the Corpus der minoischen und mykenis
cchen 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. Direct sealing practices, objects such as pots, chests, baskets or doors, were sealed 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 pendants of parchment) or to support hanging clay nodules. Similar sealing practices and, therefore, similar technical uses of textiles were attest 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 impressions, as well as cast, provide new insights into 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 architecture and religious 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-
The introduction of radiocarbon dating method in the second half the 20th Century revolutionized archaeology. Ever since the first absolute radiocarbon ages were created for archaeological contexts, the method remains a commonly-used tool applied by archaeologists. 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 archaeological samples such as removal of contamination, samples size and new developments in the calibration of the radiocarbon time-scale.

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) - Hajdus, Ika (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 useful to calibrate against tree-ring and other proxy chronologies which allowed the generation of an international radiocarbon calibration curve. 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. Myoke 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 the environment. These factors can be an important approach to the 2020 14C IntCal calibration curve can be used to define more precise dating for archaeological material, where these excursions are observed.

TEPE SADEGH’S TIME-SCALE, A BRONZE AGE SETTLEMENT IN SOUTHEAST IRAN

Abstract author(s):
Ebrahimianbagh, Satekhah (University of Bern, Institute of Archaeological Science, Prehistoric Department) - Hafner, Albert (University of Bern Institute of Archaeological Science, Prehistoric Department; Daschner Centre for Climate Change Research - OCRP - Research Group) - Shraai, Rouholah (Center for Archæological 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 focussed 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. Shahr-i-Sokhta is one of the orbital sites of Shahr-i-Sokhta, 19 KM southwest of Shahr-i-Sokhta. Pottery is one of the main materials recovered from the site, and the variation in pottery styles demonstrates that there was a different regional networks. 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? 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?

COMPOUND-SPECIFIC RADIOCARBON DATING OF PROTEINACEOUS SAMPLES USING NINHYDRIN

Abstract author(s):
Moaddes, 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 for Pre- and Protohistoric Archaeology, Kiel University) - Nahlik, Andreas (Institute of Palaeo- and Geoarchaeology, University of Tübingen),

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.chomb.2017.06.017), 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 (Naslav 1991 DOI: 10.112145.009480, Tránsil-Labors et al. 2016 DOI: 10.1017/RDC.2017.002779, Dumoulin et al. 2017 DOI: 10.1017/RDC.2017.139) 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, fingerprint, hem, 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 carboxylate can be expected in omnivores subject to dietary reservoir effects.

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, Ika (Laboratory of Ion Beam Physics, Eidgenössisches Technisches Hochschul Zürich) - Basmacioglu, Stefano - Jaggi, Madalina (Department of Earth Sciences, ETH Zürich) - Careau, Valentina (Equipe Dynamique de la biodiversité, anthro-épocologie - DBA, UMR 5564 - CNRS - Université de Montpellier, Institut des Sciences de l’évolution du Montpellier) - Antillon, Ferran (IPNA - University of Basel)

Abstract format: Oral

The AgriChange project, funded by the Swiss National Science Foundation (SNF), is focused on the agricultural practices of the communities of NW Mediterranean and Swiss areas ca. 6000-2300 BC. In this framework, we are generating a large dataset of radiocarbon (14C) and stable isotopes (δ13C and δ15N) measurements on domestic seeds, mainly cereals. While possessing all, 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 of 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?
a. MATERIAL CONSERVATION AND RADIONUCLIDIC DATING

Abstract author(s): Hajdu, Iksa (Laboratory of Ion Beam Physics, ETH Zurich)

Abstract format: Poster

The use of 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 radiocarbon 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 components. The problem of artefacts is that the radiocarbon dating materials 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 and gas chromatography (ITR, Py-GC-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): Molnár, 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. Until 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 Hartenstein Laboratory of Environmental Studies, Institute for Nuclear Research of the Hungarian Academy of Sciences we had the opportunity 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 unreported radiocarbon dates from several sites.

445 MULTIDISCIPLINARY APPROACHES TO IDENTIFY AND PRESERVE FIBRES AND TEXTILE PRODUCTS IN THE ARCHAEOLOGICAL FIELD

Theme: a. 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 Conservation) - Faillot, Vanessa (Sapienza University, Laboratory of Technological and Functional Analyses of Prehistoric Artifacts) - Marigieri, 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 analysis 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 deteriorate textiles. 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 early and poor condition of the finds, and also the immense variety of fibres 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 DNA and palaeo-ecogenomics, along with experiments on artificial ageing and deterioration of textiles, constitute a promising path down the exploration and analysis of archaeological textile remains.

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.

1 EARLY MYCENAEAN CLOTH FROM TOMB 10 AT ANCIENT ELEON IN BOEOTIA

Abstract author(s): Dimova, Bala (British School at Athens) - Burke, Brandon (University of Victoria)

Abstract format: Oral

Since 2015, the Greek-Canadian Eastern Boeotia Archaeological Project (EBA/P) has been excavating an early Mycenaean burial enclosure, called the Blue Stone Structure. Within this construction, at least 15 rock-cut tombs for multiple individuals have been located. All recovered material from the BSSI 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 belonged to a single textile, a weft-faced tabby. Also observed were natural resources on a small and larger scale decorative ven as 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 TAPFETA TO CLOTHING’S TAILORING: HOW TO DRESS THE DECEASED IN MONGOLIAN ALTAI (BURGAOST) IN A 2ND C. AD?

Abstract author(s): Baunier, Isabelle (École Pratique des Hautes Études - ÉD 472 / DGLR / UMR 8592 / PSL université) - Bernard, Vincent (Centre de Recherches en Archéologie, Archéosciences, Histoire - ChEAAM UMR 6566, Univ. Rennes 1) - Carmel, Mathilde (Archéologie et Philologie d’Orient et d’Occident - AOROC, UMR 8546 - CNRS/PSL université) - Jouly, Dominique (Archaeology Department of the City of Chartres) - Noost, Bayarkhuu - Tsgaagan, Turbat (Institute of Archaeology, Mongolian Academy of Sciences) - Zazzo, Antoine - Lepetz, Sébastien (Archéozoologie, Archéobotanique : sociétés, pratiques et environnements - AASPEE, 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 (Burgaost 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 characteristic precisely (fibres used, weaving practiced, patterns followed). The study of these textile contributes to the description of the Hun-nomadic culture and this paper will examine several hypotheses both on the origin of the raw material used, silk tapfeta, and on the role of the garments: everyday clothing or specially made for funerals? From the analysis of fibres a general understanding of the deceased’s clothing, the study of Burgaost’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) - Marigieri, 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, cellulose and proteinaceous, fabrics, artificially carbonised. Textile finds from Pompeii, of both cellulose 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 anerobic conditions. Experimentally, textile swatches were carbonised in a limited oxygen environment at 250, 350 and 500°C for one hour respectively. Although both cellulose 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 shrinks. Similarly, the fibre diameters of the cellulose fibres shrink 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 lacernation in flax, ridges in hemp, raggedness in nettle, and
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 unrecognizable degree, as long as the material is preserved.

4 IDENTIFICATION OF SILKS BY PROTEIN MASS SPECTROMETRY

Abstract author(s): Lee, Boyoung (University of Oxford; Smithsonian Museum Conservation Institute) - Pires, Elisabete (Institute of Archaeology, University of Warsaw) - 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 fibres compared 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 fibres 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): Gliba, 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 aims to analyse Roman textiles from Venetia and adjoining regions, about 90 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 the identification of raw material in most cases, except for one case. Indeed, textile 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 provided 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, cleanness, 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 brest and animal fibres, on the basis of their impressions on clay are the main focus of this presentation.

7 WHICH TOOL FOR WHICH FIBER? AN EXPERIMENTAL APPROACH

Abstract author(s): Busana, Maria Stella - Françoise, Denis - Lena, Agnese (Dept. of Cultural Heritage, University of Padua)

Abstract format: Oral

The TEPA 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, distaff) 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 top 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 those instruments could actually be used: they were suitable for specific types of fibres (especially wool) and the bone spindle with the constricted spindle whorl could make a very thin thread. Furthermore, regarding the weaving, the experimental tests were carried out using reproductions of lofts whose burmewtness 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 (LIAPABA Laboratory of Technological and Functional Analysis of Prehistoric Artefacts) - Coletti, Francesca - Gelant, Alessandra - Velli, Carlo - Jais, Alessandra - Lemosari, Cristina (Sapienza University of Rome; LIAPABA 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 residues 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 localization patterns of fibre residues along with the development of a dedicated extraction protocol. This protocol, based on great experimental results with the archaeological evidence, presenting the extraction protocol applied for textile tools coming from the site of Paldu (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 analyst and palaeobotanists.

b. YARNS FROM THE ASHES: CHARACTERIZATION OF ANCIENT TEXTILES TO ENSURE THEIR CONSERVATION

Abstract author(s): Saradini, Ilaria - Coletti, Francesca - Ocollo, Alessandro - Vicentini, Flaminia - Blance, Armandobodano - 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 archaeology 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 degrees, including dyed textiles, mineralized fabrics, goat or sheep threads [1].

Because of the different properties and particular environmental processes, a multidisciplinary research approach is necessary in order to avoid sample contamination and the alteration of the residue structure. Recent experimental researches allowed to identify localization patterns of fibre residues along with the development of a dedicated extraction protocol. This protocol, based on great experimental results with the archaeological evidence, presenting the extraction protocol applied for textile tools coming from the site of Paldu (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 analyst and palaeobotanists.

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[2] 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 restorers to the correct strategy of restoration and conservation.


c. DIGITAL CATALOG OF TEXTILE GARMENTS FROM ARCHAEOLOGICAL RESEARCH IN BIAŁA RAWSKA (18-19TH C., POLAND) - HALF WAY THROUGH THE PROJECT

Abstract author(s): Majewski, Magdalena (University of Leth, 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. Wjciech church in Biala Rawksa and popularization of knowledge about methods of protection, conservation and reconstitution 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 ruffle and vest (burial in coffin No. 5);
- 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 Shuck 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.”

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, ditched 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 barely 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 aspherical 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): Friensen, 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 pattern, 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 embanked 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 two 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): Cando-Donnay, Siria (Institut-CISS)

Abstract format: Oral

The term tata is a Western Malinke word designating a fortified political and military centre. In southern Senegal, tatae have been a key element in the articulation and conceptualisation of political landscapes since at least the 13th C and through multiple politics. 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 nomad’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 study appearance, tatae 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 ‘ULYCH: ARCHAEOLOGICAL MAP’

Abstract author(s): Marvin, Olga (National Academy of Sciences of Ukraine) - Hrabovska, Olga (Vinnytsya Regional Museum of Local History)

Abstract format: Oral

Institute of Archaeology 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 “Ulych”. It is a unique

448 JUST A DEMONSTRATION OF POWER? THE SETTING OF STRONGHOLDS WITHIN THEIR LANDSCAPE

Theme: 3. Networks, networking, communication: archaeology of interactions
Organisers: Mossael, Sebastain (German Archaeological Institute) - Ives, Kirstin (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 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 areas; strongholds are present in marginal regions, too.
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 narrow dating. According to the annals, representatives of the “Ulychi” people inhabited territories of the 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 Geoformation System (AEGS) “Ulychi. Archaeological map.”

For the new project the structure of AEGS, 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 Drivest 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): Rice, Kristin (University of Helsinki)

Abstract format: Oral

Six Late Iron Age (AD 650-1050) 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 shoreline 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 unconnected 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 is distinctively ‘offensive’ location on a small and more peripheral rock of an island, one 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 Late Iron Age archaeological material within the archipelago, and the distribution of the hill-forts, it has been suggested that Ålandic communities at that time, and both had a sort of three hill-forts each. 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): Schniewind, 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 the surrounding low of areas as well as on top of the Hill. The Moesgaard 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 Moesgaard ended with the end of the 10th c. and was declining until the final abandonment. The site is situated in 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 above 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 TEMPLE FORTRESS OF ARKONA, the first pagan sanctuary of the Western Slavs, is one of the most impressive strongholds along the southern Baltic coast. The detailed report of the Danish chronicles Saxo Grammaticus of the events of the year 1168 – when Valdemar conquered the island of Rügen and destroyed the temple fortress of Arkona – mentions only a Roman 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 north- easternmost 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.
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 in 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 as 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): Huismen, 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 railways.

In the past 25 years the process has changed and with it the networks and relationship between building companies 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 Bathuwarte, The Haroelpoort, Spoorzone Diest and Groningen/Nijmegen 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, Monno (Explodap)
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 online platforms 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 archaeological 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 archaeological society benefit?

5 LARGE SCALE EXCAVATIONS AND SMALL FENS. EXPERIENCES FROM NORTH ZEALAND, DENMARK

Abstract author(s): Assleff, Esben (Museum Nordjylland)
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 Frederikssund, 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 typical the case.

The combined area (hospital and infrastructural) 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 exceptionally 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 set a price 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 focuses on establishing what public benefit might be and how we can measure it. It is intended that the results of this will extend cultural participation and appreciation of archaeology at the core of public spending on infrastructure. Collaboration across Europe through the Europe Archaeologiae Con- (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

Format: Regular session

The knapped stones, like flint or obsidian, are unusual kinds of raw material. Thanks to various properties they influence the sensess with color, texture, degree of transparency or signal used - they produce sound, react with other materials or signal their origin. Their process- ing 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 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 EpiPalaeolithic/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 should they 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 time, space and economic, social, cultural and technical conditions.

The early stages of the Bronze Age were set as the time limit of the session.

545 1 INTRA-SITE VARIABILITY IN LATE NATUFIAN FLINT ASSEMBLAGES: THE CASE OF RAEFET CAVE, MOUNT CARMEL, ISRAEL

Abstract author(s): Berntow-Paz, Gal - Weinstein-Evron, Min - Nadal, Dani (Zimmer Institute of Archaeology, University of Ha-ifa)
Abstract format: Oral

The Natufian culture (ca. 16,000 -11,500 cal. BP) played a pivotal role in the transition from hunting-gathering to agricultural econo- mies and sedentary settlements in the southern Levant. Among the rich material remains, the first assemblages have been studied extensively over the years providing chronological and geographical variability, as well as reconstruction of daily activities. Rafeqet 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 90 burials, a variety of bedrock features and a wealth of lithic, faunal and floral remains, including evidence for “flower burials” and weevils by the open gravers. 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 characterize
the flint assemblage, b) map the sources of the raw materials and the utilization variability among them, c) address the taphonomic 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.

3. HOW ARE THE INNOVATIONS IN THE LITHIC TECHNOLOGIES RELATED TO THE SOCIO-POLITICAL CHANGES? THE CASE OF CUCUTENI FLINT ASSEMBLAGES

Abstract author(s): Veronika, Diana-Maria (Institute of Archaeology in Iaşi, Romanian Academy)

Abstract format: Oral

During the 11th and 10th 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 and technological retouching. Tracking 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 is connected in the first half of the 11th millennium BC with technological achievement, with the Southern neighbours, namely the Gumelnita-Kadzadermen-Karanovo VI. In the 10th millennium BC the centre of interest and political power from the regions changes to the north and the connections to the northern and western route are more visible in the Late Cucuteni.

4. BERÊZEOVO 2—a SETTLEMENT AND SLATE WORKSHOP—ON THE KARELIAN ISTHmus (NORTH-WEST RUSSIA)

Abstract author(s): Teach, Evgenia (Institute for the History of Culture in Russia); Peter the Great Museum of Ethnography and Ethnology, the Kunstkamera) - Musaeu, Roman (Independent researcher) - Serasimov, 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 Berezo-vo 2 workshop-settlement (since 3000–2900 BC) was carried out on the Karelian Isthmus between the Gulf of Finland and the Ladoga Lake, which made it possible to offer a representative collection of finds with more than 1000 slate artefacts. A feature of workshops for treating certain materials (flint, quartz, amber, etc.) are well-known in so-called “Forest” or non-agricultural Neolith of the Eastern Europe–Western Russia zone. Outstanding examples of workshops for axes of metateff are presented at the western part of the Neolithic and Eneolithic in Karelia. A representative workshop was excavated in 2018 from excavation of Berezo-vo 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 (pointsolate), woodworking (chisels, adzes 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 bar (20% of the total) to intermediate- and end-product. A high percentage of raw slate bars, preforms and unfinished blanks with traces of abrasive processing — sawing and 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 Ladoga Neolithic — Eneolithic. The study was performed within the project “Phenomenon of Asbestos Ware in prehistoric traditions of Eastern Europe: making and use technology, structure of interregional contacts” supported by the Russian Science Foundation, #19-18-00370.

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): Kieleńska, Aleksandra (University of Warsaw) - Januszuk, 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. II), situated on the right bank of the Sąpryski 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 qualitative selection of flint artefacts for ritual purposes, as well as to recognise their pre-depositional biology, a SIAM 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 EPIPRAVETTIAN INDUSTRIES OF MIDDLE DNIEPER BASIN: MEZHYRICH AND BARMAYK

Abstract author(s): Dudyn, Diana (Archaeology 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 Epipaleolithic industries: Mezhirych and Myzin types. The Mezhirych assemblage belongs to the first one, the Barmayk assemblage – to the second one. The Mezhirych complex dates around 17 ky 14C BP as well as Gintsi, Dobranychivka, Samenivka 8; the Barmayk complex – around 19 ky 14C cal BP. Technological and typological features of industries are using and production of blade tools, biface and bi-polar cores for blades; bladelets and microbladelets 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.

b. THE MAGDALENIAN PERIOD IN BOHEMIA (CZECH REPUBLIC) IN THE CONTEXT OF THE CENTRAL EUROPE

Abstract author(s): Záhorský, 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 an aeron technology in Bohemian and Moravian 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 Balatonca, Liscíčie I – Košť Hill and Hanice na Morave V – Velká Kobylnka are already in the process of being worked with, while Bohemian sites like Hostim and Děravá 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.

d. FLINTS ARROWHEADS AND THEIR INTERPRETATIONAL FEATURES. ON EXAMPLES FROM THE BAJOROVICE FOREST (WESTERN BELARUS)
Abstract author(s): Kocha, Aleksandra (University of Warsaw) - Tkachou, Aleh - Vashanan, 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 promises 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 Bajorovice Forest (Western Belarus). During excavations in 2017, at the site Kaminiański I, located to the north of the Kaminiański village (Kamieniec district) on a sandy elevation along the lagoon of the Leśna Prawa river, seven such arrowheads were found. The ones 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 Pareneolithic phenomenon of the forest zone. This paper presents the results of micro-technological studies on Eastern flint assemblages. Borkowski, W., 1987. Neolithical and Early Bronze Age heart-shaped arrow heads from the Little Poland Upland. Archeologia Interregionalis, 8, 147–181.

c. 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 Étvotes Loránd University) - Marteau, Julie (Laboratoire Roberval - UMR-CNRS 7397, Université de Technologie de Compiègne, Centre de Recherches de Royallieu) - Dalton, Raphaël - Moreau, Philippe (Laboratoire d'Automatique, de Mécanique et d'Informatique industrielle et Humaines - LAMIM UR-CNRS 2012, Université et École Polytechnique des Hauts de France) - Lengel, György (Département de Préhistoire, Archéologie, University of Miskolc) - Bosil, Antony (Histoire Naturelle de l’Hemme Préhistorique - HNNP, Muséum national d’histoire naturelle, CNRS, UPVD; Institute of Archaeological Sciences, Étvotes Loránd University)
Abstract format: Poster
Wear analysis applied to prehistoric aims to characterize mainly qualitatively the surface alterations of tools made of stone, bone or other kinds of raw material in order to determine tasks 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 analyses 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 NRDI Fund (K 132657).

547 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) - Cañedá, Astor - Romañol, Francisco (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 prehistorical 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.

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) - Atmaja, Silke - Baheem, Bre (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 biased 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 assembly 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 archaeological 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 modelling 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 chaine opératoire. High-resolution individual-level data on kolam designs were collected, transcribed and digitized. Kolam designs were quantified by Shannon information entropy and the total number of gestures. Bayesian modelling 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.

The project is financed from the NRDI Fund (K 132657).
2 CONSTRUCTING THE NICHES FOR LEARNING AND EXPERTISE: THE ROLE OF PLAY OBJECTS AND OBJECT PLAY IN SOCIAL TRANSMISSION

Abstract author(s): Redo, 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 have placed 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 playing 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 cultures. 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 cultures 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 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 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 Prajapati (Hindi) and the Mola (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 affects 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): Carone, Ashley (Blieck Seyh Edébali Universités; 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 workshop was held at Blieck Seyh Edébali Universities (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): Danis, Suline (UMR 7055 Préhistoire et Technologie; LIATEC, Université de Namur)

Abstract format: Oral

Studies on the apprenticeship modalities among knappers of the Danubian Early Neolithic remains to this day extremely rare. In fact, they finally underlie 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 Bélgica/Valleianve-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): Costafreda, Núria (Universitat Autonoma de Madrid) - Bostyn, Françoise - Giligny, François (Université Paris 1-Panthéon Sorbonne; UMR 8215 Trocaires)

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 4500 to 2250 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 was 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 roughouts 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 an 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-Semperera, Izar (Société de Ciencias Aranzadi) – Martin-Colliga, Araceli (Servic d’Arqueologia i Paleontologia de la Generalitat de Catalunya) – Gibaja Rao, Juan Francisco (Institucion Milà i Fontanals – IMF-CRIB) – 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 Catalonia. 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 Bibla 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 270 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 associated to the raw material procurement and the manufacturing 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.
INTERDISCIPLINARITY IN THE ARCHAEOLOGICAL RESEARCH OF RELIGIOUS PHENOMENA

**Theme:** Interactions and boundaries between different disciplines and approaches to the study of religious practices and belief systems in prehistoric and historical contexts.

**Organisers:** Gresz, Ágnes (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)

**Abstract format:** Oral

The session focuses on the interdisciplinary approaches to the study of religious phenomena in the archaeological record. It aims to bring together researchers from different fields, including anthropology, ethnoarchaeology, and cognitive sciences, to explore the complex interactions between human societies and their religious practices. The emphasis is on the use of experimental methods and the integration of different methodologies to understand the emergence and evolution of religious beliefs and practices. The session will feature presentations on case studies from various parts of the world, highlighting the importance of interdisciplinary collaboration in advancing our understanding of prehistoric religious phenomena.

**ABSTRACTS**

1. RITUAL AND COMMUNITY – STUDYING THE IMPORTANCE OF RITUAL WITH APPROACHES FROM THE SOCIOLOGY OF RELIGION

**Abstract author(s):** Holbe, Isabel (Romano-Germanic Commission Frankfurt, German Archaeological Institute)

**Abstract format:** Oral

The presentation will discuss the importance of ritual in the study of prehistoric and historical communities, emphasizing the role of ritual in social cohesion and the structuring of society. It will explore how ritual practices can shed light on the social organization of communities and the relationships between different groups. The session will include case studies from various periods and regions, illustrating the diverse ways in which rituals have been used to maintain social order and to mark significant events and transitions in the life of communities.
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 regard to this presentation we 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): Fraimi, Tiffany (Ruprecht-Karls-Universität Heidelberg)
Abstract format: Oral

The stamps 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 east 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 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 - Abdelfattah, Khalid (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 night time journey of the sun god Ra through the underworld in the New Kingdom. The scenes of Netherworld Books can be described as very closely and completely applied scenes 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-Gaissed 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 abbreviated 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 today. In addition 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 – BÜGSTALL
Abstract author(s): Monro, 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 mainly lowlands of the Lava Fertő. The Bügstall (Kisbásty in Hungarian) is 4.5 km far from the centre of city as the crow flies. The hillfort populated for the first time in the Hungarian Late Bronze Age by the Umfeld 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 Galkus in the mid 1990’s. Surveys did not pay much attention to it, however this little sign could be a key element to understand the conception of resurrection.

8 TWO REFLECTIONS OF LIGHT – THE BRONZE AGE AND THE LATE ANTIQUITY (A COMPARISON)
Abstract author(s): Goral, 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, if, when constructing material objects, light reflecting surfaces were formed or raw materials (constructions, 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, light resulted with light reflected 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 (Privata Consultant)
Abstract format: Oral

Archaeological inaccuracies of belief, so tied up in contemporary notions of religion, are not made easy 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 religion and biology (the science and religion “the belief system”) are seemingly incongruent and explains some of the squawkiness 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. 7000-5500 BCE) on the Colorado Plateau. Here, early agriculturalists used rock shelters to bury their dead in very specific and elaborately designed ways suggestive, at minimum, of “facts” and ones hauntingly similar to that of their historic descendants. This presentation explores acts of belief and their material correlates using Basketmaker burial 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, Peloponnisos and their relation to the Eleusinian from archaeological, theological, ritual and architectural aspect. The secret character about the teleté procession of 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 drómena 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? What was their role to 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 sacred face of this cult could influence the initiates? Very important parameter for this religious phenomenon was the architectural layout of the sanctuary of Despoina, which transformed 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 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 social mobility of the dedicants by finding their families or examining the intent behind their prayers. Through this analysis, the most valuable insight will be reached into the beliefs of individuals and in what 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 – containing 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): Buk, Juditka (Jagellonian University)

Abstract format: Poster

Votive anthropomorphic figurines cuchimilcos 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, with 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-Colombian Chancay culture. Votive anthropomorphic figurines were put into graves, they were usually put in pairs, being part of the deceased 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: Póth, Stephen - Lászlósványi, 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 in the development of Russia, Poland, Bohemia, Croatia and Hungary. The territories on 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 European 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 (battlegrounds, 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): Verga, Maria (Universität Wien)

Abstract format: Oral

It is a generally accepted theory in Hungarian history that the Mongol invasion has 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 found 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, Bálint (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 evidences on that issue.

3 MILITARIA WITH CONNECTION TO THE MONGOL INVASION OF 1241-1242 NORTH OF THE DANUBE

Abstract author(s): Holcsoók, Michel (OA SÁKI)

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 Lagina in order to join the main column of Batu. They passed the researched territory and pilgraged the countryside, camping for a few months north of the Danube, until the river froze and they crossed it close to Esztergom. 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, targeted arrowheads with specificially 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, Andrey (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 25th, 1238 during the invasion of Mongol-Tatars in Russia 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 woman, 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 destructions.
TRAC-T - TRACING REALITY IN ARCHAEOLOGY USING MACHINE LEARNING

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-modal 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 shards into an object, visual recognition of sort 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

MACHINE LEARNING APPROACHES FOR OPTIMIZED SEMI-AUTOMATIC ANALYSIS OF ANCIENT GRAINS

Abstract author(s): Mirea, 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) - Mirea, Ioan (Department of Computer Science, Faculty of Mathematics and Informatics, Babes-Bolyai University, Cluj-Napoca) - Potârniche, Tiberiu (Museum of National History and Archeology, Cluj-Napoca) - Kálmán, Beatrice (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca) - Cucu, Mihaela (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 (Constanta 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 properly extracted features and then use the obtained clusters for an optimized semi-automated labelling of archaeological cereal grains.

Acknowledgments

The present work has received financial support through the project: Entrepreneurship for Innovation through doctoral and post-doctoral research, POSDRU/1960/1.5/S/123896 co-Financed by the European Social Fund, through the Operational Program for Human Capital 2014-2020.

BRINGING MACHINE LEARNING TO TAPHonomy, IDENTIFYING CARNivore TOOTH MARKS IN BONE SURFACE WITH ML ALGORITHMS: CROCODILES AND WOLVES

Abstract author(s): Asilou Beltrán, Natacha (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 archeological 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 fids, 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 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 (Chernoff’s Face, PCA, Procrustes and wolves) are introduced to test their 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.

DIFFICULTIES TRACING AND INTERPRETING PATTERNS IN COMPOSITIONAL DATA OF METAL ARTEFACTS: WHY ARE THE MORE COMPLEX METHODS NOT ALWAYS USEFUL?

Abstract author(s): Papdi, Petr (Department of Archaeology and Museology, Masaryk University) - Danilovs, Alībērs - Bursāk, Daniel (Institute of Archaeology CAS, Prague) - Strnad, Ladislav - Tuba, 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 our case, sticking to less complicated machine learning methods proved useful in interpreting the results both in archaeological and raw material provenance terms. In general, unsupervised learning methods are not always leading to better interpolation 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.

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 model and intent 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 generates models based on the location of the fractures, their lethality, biological sex, age, and burial place of the individuals. It increases in sensitivity through interactions predicts more accurately with time.

This talks presents a concept of using 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.
REALITY IS WHAT I RECOGNISE? CHOICE OF FACTORS AND ML IN SOCIAL ARCHAEOLOGY

Abstract author(s): Doiroto, 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 qualitative and basic explanatory statistics, the data is often not grouped strongly enough or exhibit clear patterns. Machine Learning can, albeit it's own theoretical and methodological problems, distinguish patterns ins 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, we can 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.

MORE THAN THE EYE CAN SEE - MACHINE LEARNING AND ROCK ART

Abstract author(s): Horn, Christian - Ling, Johan (University of Gothenburg) - Jarseason, 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 (1300-600 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 RNN) 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.

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 and understandings, we will explore how the senses 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 into 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 do they work collectively? In this session, we will explore how sensory networking and interactivity can provide essential information for today’s archaeologists 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.
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 elevation relative to the local area) and islands. The university 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): Czontio, Karolina (University of Gdańsk, Archaeological Museum in Gdańsk) - Świtałkowski, Bartosz (University of Gdańsk)

Abstract format: Oral

Located near Svenen 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 obtained such as pottery, bones and weapons indicate the existence of settlement and production workshops at 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” (”golden 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 2015 from researchers from Bornholms Museum, the University of Aarhus and the University of Gdańsk as a part of the ArchaeoBalt project, gave impressive results, which revealed 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): Biaczyński, Jack (Institute of Archaeology University Nicolaus Copernicus in Toruń)

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 determinants 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 small cavities oriented 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 FUNERARIES AND FEATHERY SACRIFICES. BIRDS IN THE VIKING AGE BURIALS AND BELIEFS

Abstract author(s): Karpińska, 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 funerary in Finn Fadnín’s Risala, part of the puzzling ritual in Saxo Grammat. These examinations will allow to bring closer the meaning and roles of the images of Slavic sacrum.

5 CAPTURING TRACING TRACES OF POST-CREMATION PRACTICES: INTERDISCIPLINARY COLLABORATION APPLIED TO ANALYSES OF NATURAL PRODUCTS FROM VIKING AGE CREMATION BURIALS

Abstract author(s): Jelicic, 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 contemporaneous 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 mineralogy, paleoecology, and especially with palaeoethnobotany (taxon determination of archaeological eggshells containing protein). Each of these fragments of knowledge is seen as a vital building block in recon- structing 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 Volvo 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 scenario is described as a kind of a well-ordered society or micro-world—in terms of Lévi-Strauss “société à mission”. The house module 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. The theme of 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): Szczepanski, Pawel (Institute of Archaeology Nicolaus Copernicus University in Toruń)

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, anthropological 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 Friedberg’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. These 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”.

8 PROJECT PRESENTATION: A DIGITAL EDITION OF THE GOTLANDIC PICTURE STONES

Abstract author(s): Oehr, Sigmund (Institut für archäologien und antiken 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 Iune Lindqvist’s edition “Gotländs Bildstenar”. 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 670 picture stones are known. Secondly, all interpretations have been based on Lindqvist’s painted pic-
tures, that is on the fundamental perception of the shallow carved lines by a single scholar. Although Lindqvist was an excellent spec-
ialist, 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 recently started, financed by the Swedish Research Council, located at Stockholm Uni-
versity and Gotlands Museum, in order to create a new digital edition of the entire material. The project has three major aims: 1.)
Digitising the entire corpus of Gotland’s picture stones, applying the most advanced 2.5D and 3D recording methods. 2.) Creat-
ing 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

Abstract author(s):

Ferentinos, Georgios - Fukari, Elias - Christodoulou, Dimitris - Gregoris, Maria - Prevonios, Michalis - Kordela, Stavroula - Dimas, Xenofon - Georgiou, Nicos - Papathodorou, Georg (Department of Geology, University of Patras)

Abstract format: Oral

An offshore survey around Kafalonia Island in the Ionian Sea was undertaken by the INTEROFF IV Greece Italy 2007-2013 Programme. It 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 tech-
niques in processing sonar pictures for automated recognition of ancient wrecks with an amphora cargo. The shipwreck, based on the sonar images, is about 34 m. long, 12 m. wide, and 9 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 shipreck dimensions make it one of the four largest merchant shipwrecks of the ancient world. The two other wrecks with a length of about 40m were the ‘Mad-
targas de Gien’, the ‘Alberga’ and the ‘Machida’.

The amphora cargos in the hulls are about 3.5 m. high, of which 3.9 m above seabed and 2 m. sunk in the seabed. The amphora are in very good state of preservation (Fig. 2a) and about 0.90 m long and 0.40 m. wide (Fig 2b). Taking into consideration the size of the ship and amphoras 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, amphora hull storage, ship construction, the type of wood used and its source.

4 FELDLUFTPAK Pori: APPLICATION OF GIS TO LOCATE, RESEARCH AND PROTECT CULTURAL
HERITAGE OF THE LUFTWAFFE AIRFIELD IN PORI, FINLAND

Abstract author(s): Vasinen, Tooma (Satakunta Museum)

Abstract format: Oral

In this paper, I will discuss desk-based research methods for locating, researching and protecting wartime cultural heritage in Fin-
land. As official guidelines for archaeological field surveys have only recently included WWII sites among the sites of interest, effi-
cient 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 tech-
nical support to Luftflotte 6 division operating in Northern Norway and Finland. During the war, the airfield grew into a complex depot consisting of over 300 constructions, including hangers, aircraft shelters and barrack. 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 demolish after the war and their re-

ences 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 archae-
ological research project that will be presented in a publication and exhibition in 2022.

3 UNDERWATER REMOTE SENSING TECHNIQUES FOR DETECTING AND ASSESSING SHIPWRECKS: THE
FISCARDO ROMAN SHIPWRECK, IONIAN SEA, GREECE

Abstract author(s):

Ferentinos, Georgios - Fukari, Elias - Christodoulou, Dimitris - Gregoris, Maria - Prevonios, Michalis - Kordela, Stavroula - Dimas, Xenofon - Georgiou, Nicos - Papathodorou, Georg (Department of Geology, University of Patras)

Abstract format: Oral

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targas de Gien’, the ‘Alberga’ and the ‘Machida’.

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2 PRODUCTIVE ARCHITECTURE WITHIN UNCHARTED MOUNTAINS IN THE UPPER ICA RIVER BASIN, PERU

Abstract author(s): Acosta Parsons, Diana (ILDAM)

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 endur-

aging presence of agriculture and horticultural communities. For the first time, about 44.160ha ranging between 1150masl to 4200masl, mostly occupied by terraces, settlements and semi-artificial landscapes were registered and analyzed.

The in situ survey proved to be a challenging task, considering the steep slopes, poor road conditions and non-existent archaeolog-
ical 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
data set.

The data collected allowed to correlate settlement sites with productive areas, in order to explore the vertical use of the land than

and now. An assessment of the terraces conservation status in relation with its modern use was possible as well. Finally, a partial re-

construction of the local landscape modification and occupation processes was suggested.

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 ar-
chaologlcal record in Poland, especially in the context of the national field walking programme that has been carried out since the
1990’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, curesus 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 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 rule. It is interesting that perhaps holding to the idea 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.
VOIDS IN SETTLEMENT PATTERN DATASETS, BIAS AND UNCERTAINTY OF NON-RESEARCHABLE AREAS IN ARCHAEOLOGICAL MODELLING

Abstract author(s): Mastelházy, Gábor (Castle Headquarters' Integrated Regional Development Centre)

Abstract format: Oral

Non-invasive survey methods are widely used across the world as a reliable survey method in scientific and development-led researches to locate and identify archaeological features and sites. Many efforts have been made earlier to understand the capabilities 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-researchable areas due to temporary or permanent coverage.

A detailed analysis was carried out in a 950 km² area around the city of Pujega (NE Hungary) to analyse regional-scale effects of land cover on site identification. As a first step three CORINE datasets (CLC100, CLC100 change, Hungarian CLC100) were used to locate and identify the currently researchable areas, but also those zones where the land cover changes alter the survey options in the past decades.

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.

NON-INVASIVE METHODS FOR VOLGA BULGARIA FORTIFIED SETTLEMENTS MONITORING

Abstract author(s): Usmanov, Bulat (Institute of Environmental Sciences, Kazan Federal University) - Gainullin, Ishker (Research Centre "Country of Cities", Kazan)

Abstract format: Oral

This work is a part of the research (Russian Foundation for Basic Research project N19-09-40114) aimed at developing a system of methods for archaeological 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 archaeological sites within the territory of the Volga Bulgaria with the use of remote sensing methods, complex field studies and cartographic-geoinformational approaches to data processing is developed. One of the main used methods is archival and modern remote sensing data analysis that makes it possible 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 orthophotos are used to get qualitative characteristics of monument territory damage. Modern instrumental methods have been used in order to collect information on dangerous exogenous 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.

... AND IN DARKNESS ITS NAME IS COVERED” ARCHAEOLOGICAL PROSPECTION OF PERISHED MEDIEVAL CHURCHES IN HUNGARY

Abstract author(s): csirik, Ádám, Gáspár János Egyetem (Archéologiai Intézet)

Abstract format: Oral

Due to the peculiar history of the Hungarian Basin, most of its medieval settlement pattern is perished, alongside with their landmark features: the medieval rural church. Scarcely any of the dance 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 runs are not only former ecclesiastical places, but also crucial parts of the medieval settlement network, all of them had 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 discover such a church within a day.

Finding these long-forbidden 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 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 SLOVANIA (CROATIA)

Abstract author(s): Mayer, Cornelius (eprospection)

Abstract format: Oral

Slovenia, 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 Slovenia. The motivations 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 detail of data, the data sets must be considered 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 archaeological investigations. Furthermore, the limited budget also implies 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.

A COMPROMISE BETWEEN WISHES, NEEDS AND POSSIBILITIES. NON-INVASIVE SURVEY OF STRONGHOLDS IN SE GREATER POLAND

Abstract author(s): Maszkiewicz, Maciej (Archaeolodzy 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 organized, complex societies. Their location was determined by various factors. Very often they were the stage for events of supraregional 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 different defensive networks, sometimes 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 is 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 work was based on complementary application of non-invasive methods: remote sensing (ALS, aerial prospection, 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 patrons, 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 (popularising archaeology and its new methods; raising the awareness about archaeological heritage).

THE ARCHAEOLOGICAL HYBLEAN 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) - Iida, Livio - Mrito, Vittorio (Università degli Studi di Catania) - Scerra, Saviero (Soprintendenza BB.CC.AA. di Ragusa) - Tortarici, Edouardo (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. Though we are not there, we might have the tools to achieve it.

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induced electromagnetic survey, intensive use of ground penetrating radar and electrical resistivity tomography). The Archaeological Hydrobaux Landscapes Survey Project (524,9 km²) has been designed for a new understanding the routes networks, the rural economy and the settlement dynamics in the ancient countryside, moving from an essentially site-based approach to a truly landscape-scope perspective. All data (sherd scatterings from field surveys; cropmarks from proximal sensing; anomalies from archaeogeophysical prospections) were stored in a Geographic Information System, which allowed spatial analyses and the creation of thematic maps. The integrated geoarchaeological approach has led to a new archaeological map from Prehistory to Medieval and going beyond the narrative of Sicula Frumentia, providing an updated view of the rich archaeological heritage in that territory and a more complex and comprehensive understanding of a stretch of low- and upland rural landscape in southeastern Sicily (agriculture vs pastasional; cultivated landscapes vs wilderness; settlement patterns; regional vs local routes networks).

11 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) - Wronecki, Piotr (University of Wrocław)

Abstract format: Oral

The results of archaeological investigations that will be presented in this paper are a part of wider project entitled “Cultural and natural heritage of the Bialowieża 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 studies, as well as the presence of natural objects like river or bog on non-ALS, we can try to recreate the history of the studied micro-region where numerous archaeologically interesting 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.

12 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) - Giolotij, 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 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 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.

a. NON-INVASIVE FIELD SURVEY METHODS USED FOR THE HERITAGE PROTECTION AND ARCHAEOLOGICAL RESEARCH IN HUNGARY

Abstract author(s): Keller, Molinda (Várkapténygyár 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 documentation for EU projects. 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.

472 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: Forestall, Colin (CIfA, RHES; UKR) - Kaszás, Gabriella (-)
Format: Regular session

With the increasing move towards digitisation and paperless record across the EAA region, and the inherent increase of data storage and reliance on data software we are losing the ability to go and utilise previous archive 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 LiDAR 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 policy 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 DIGISITE the Archive debate within the EAA.

473 ABSTRACTS

1 CRISIS? WHAT CRISIS? WHAT DO WE UNDERSTAND BY THE TERM ARCHIVING AND HOW HAS ITS MEANING CHANGED OVER TIME?

The regional-scale archaeological projects have been started in 1968 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 inventory 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.
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 territo-
ry in the field of archaeological research. This has resulted in an increase of archaeological investigations with the main aim of doc-
umenting what will be lost due to the construction process, while laying 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 archae-
ological 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. 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 cons 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 the least the same costs? and What will we do once all the archaeological deposits are filed?

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 stand-
dards, 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 referred to 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 prac-
tical 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
archaeology legacy project, as well as our experience with working within Scottish archaeology and heritage.

SYNTHESIS: THE WAY FORWARD?

Abstract author(s): Forrestal, Colin (Universitàt Rovira i Virgili) - (PHIES)

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 en-
compassing/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 synthesize these into the
new paradigm.

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 (Universityet Jagielloniski i Krakowie) - Vijitas, 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 archaeological 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- Germany, Serbia, Romania, Russia, 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 Car-
pathian Basin and, especially on their borders such as Carpathian or Alps, wishing to create the platform for exchanging of informa-
tion, 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.

THE IDEA AND SPREAD OF CAMPLIKE, WOOD AND EARTH-STRUCTURED FORTIFICATIONS IN CENTRAL EUROPE, WITH SPECIAL EMPHASIS ON THE CARPATHIAN BASIN

Abstract author(s): Sándoré, Gábor (Hermit Ött 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 rampsarts with wood and earth-structures.

The core area for the idea of wood and earthworks were Bohemia and Moravia. A number of those structures were built during the
Hussite wars (1419-1434). After the wars, a host of Hussite 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.

Oul war broke out in the Hungarian Kingdom between 1440 and 1460. The fighting parties liked to use Hungarian soldiers here too. Using
the vacuum in power however, the Hussite mercenaries occupied the Northern region of Hungary, establishing their own
political and military might. The basis of their power were the strongholds they had 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 forward works were built in the vicinity of castles in Slovakia and Northern Hungary. A very well
examined example is the Castle of Slajdómné, which will be used to display the camplike rampart architecture during this presenta-
tion.

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.

ARCHAEOLOGICAL TRACES OF MILITARY ACTIVITY AT THE EASTERN BORDER OF CARPATHIAN BASIN DURING THE 18TH-19TH CENTURIES

Abstract author(s): Bolohan, Necsul (Alexandru Ioan Cuza University of Iași) - Demjen, Andreä-Erzbislet (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 epidem-
ics. 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 Prícske-Eastern Carpathians
that was built in a less important pass (In 1778 there were discussions on transforming the quarantine in a secondary asylum) and it
did not have a complex defensive system. There was only a surveillance spot on Priscke peak, a fortification consisting of a ditch
and a palisade. The written records mention that the fortification on Priscke peak was constructed after the Austrians took over
the area, at the beginning of the 18th century. In 1700, under the leadership of general Lainitz, a ditch and palisade fortification was
built at Pricske passus. Later on, in 1747, general Bohm briefly described that on the Priscke peak there was a fortified sentry
house, manned by a few guards and horses, 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 build-
ing the quarantines and the fortifications. The cordon sanitaire represented the defensive line in the anti-epidemics battle, con-
necting quarantines 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
THE CARPATHIAN WALL 1916 - THE GREAT WAR IN NORTH-EAST SLOVAKIA

Abstract author(s): Vojtaš, Martin (Department of Archaeology and Museology, Faculty of Arts, Masaryk university) - Žubalík, Jiří (Institute for Archaeological Heritage, Brno) - Fojtík, Martin (Department of Archaeology and Museology, Faculty of Arts, Masaryk university) - Bílík, Richard (Institute for Archaeological Heritage, Brno) - Bonothyšek, Jiřík (Archea Brno) - Petřík, Jan (Department of Geotepic Sciences, Faculty of Science, Masaryk University) - Kapavík, Radim (Stigmatum Belli 1914) - Tájkov, Peter (Department of Art History and At Theory, Faculty of Arts, Technical University of Košice)

Abstract format: Oral

The Carpathian mountains were place of intense fighting between these 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-eastern Slovakia. This territory was a witness of offensives of both sides, which resulted in up to 45,000 dead soldiers and 260,000 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 questions:

1. How did the German army organize building of fortifications at strategically important positions in early spring of 1915?

2. What were conditions of trench life in Carpathian battlefields?

3. How did the weather condition and terrain influence the battle?

Remote sensing data (LiDAR, contemporary and historical aerial photographs) have been used to identify an actual extent of fortified areas. Period engineer manuals are important for interpretation of documented relics - for example, The Germans used several field fortifications in South Moravia. Nowadays, the highest number of relics of those fortifications 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 methodology and interpretation.

4. CARPATHIAN WINTER WAR. HOW TO RESTORE THE MEMORY OF THE GREAT WAR IN XXI CENTURY WAY.

Abstract author(s): Czarownicz, Marcin - Osdahl-Czarownicz, Agnieszka - Kołodziejczyk, Piotr - Karmowski, Jacek (Jagiellonian University)

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 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 Beskid Zaszczyty became Austrian-Hungarian front line in front of the Russian army. The enemy movement.

Moreover, visualization means is mobile application helping the user in search and travel through the abovementioned battlefield of the Great War.

During our presentation we would like to present the methodology of our research, showing the solutions used by us in inaccessible areas 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 is to bring the narrative to the way as it should tell in XI century to drag the attention of the young people. The outcome of our experiments is mobile application helping the user in search and travel through the abovementioned battlefield of the Great War.

ON WESTERN BORDERS OF CARPATHIANS: THE END OF WORLD WAR 2 IN SOUTH MORAVIA

Abstract author(s): Žubalík, Jiří (Instituta 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 fortifications 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 methodology and interpretation.

Remote sensing data (LiDAR, contemporary and historical aerial photographs) have been used to identify an actual extent of fortified 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 digitised in ArcGIS. Next, wide space 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 opponent 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 fights, though war was already decided.

CONTRIBUTION OF ARCHAEOLOGICAL PROSPECTION TO THE RESEARCH OF AN EARLY MODERN BATTLEFIELD NEAR VEĽKE VOZOKANY

Abstract author(s): Drozd, Dominik - Neumann, Martin - Bítor, Josef (Comenius University Bratislava)

Abstract format: Poster

Since 1641, the territory of Upper Hungary was continually threatened by the Ottoman armies. The rising power of new European – Austrian forces was clearly demonstrated by establishing of Ottoman administration in Budin at the same year. Henceforth, the Hungary was divided into 9 parts – Budín, Slatina, 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 Žitavka valley (SW Slovakia). It gained much attention due to its position at Veľke Vozokany, where 4 members of Esterházy family died. Memoires of Pál Eszterházy, letters and other contemporary, as well as, later historical accounts contributed to very heterogeneous 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 been brought to attention. 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.

THE BIOARCHAEOLOGICAL SENSOR-LITHEAL LETHAL AND OTHER NOT-SO-ULTIMATE INTERACTIONS: EXPLORING THE INTERFACE BETWEEN TRAUMA AND TAPHONY

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 intrinsic (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-mortem 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 other evidence that may point to violence in skeletal remains, highlighting the need to consider both the biocultural context (represented by remains and their deposition or burial, associated archaeology and histories and their temporospatial 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 curtailed human remains).

The session is focused 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.

SKELETAL TRAUMA AND TAPHONY: NAVIGATING COMMON PITFALLS AND COMPLEX CHALLENGES

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 sometimes poses a challenge to correctly assess the actual timing of injury in relation to the complex triad of death, burial and decay. Differentiation between pre-mortem (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 literature – might not be revisited for quite some time. Using extant examples from various archaeological sites this presentation aims 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.

ABSTRACTS

1

SKELETAL TRAUMA AND TAPHONY: NAVIGATING COMMON PITFALLS AND COMPLEX CHALLENGES

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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 sometimes poses a challenge to correctly assess the actual timing of injury in relation to the complex triad of death, burial and decay. Differentiation between pre-mortem (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 literature – might not be revised for quite some time. Using extant examples from various archaeological sites this presentation aims 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.
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 assemblages at hand. Long-term processes of weathering, root-stitching, rare anatomical variants, interindividual variability, or even archaeological processes like taphonomic alterations, projectile points, 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 awareness is key and needs to be actively pursued in any serious scientific interpretation.

2 AN ENELITHIC MASS GRAVE FROM ALBA ILIJA-LUMEÀ NOUA (ROMANIA): PERIMORTEM BLUNT FORCE TRAUMA AS EVIDENCE FOR A VIOLENT EVENT?

Abstract author(s): Olgor, Mihaíl - Fetcu, Ana (1 December 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-Lumeà 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 uneartthing of a mass grave (Trench N,2019), where the remains of 11 individuals (6 subadults, 4 subadults and two non-adult adults) 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): Mollenrup, Lena (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 Enga 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 peri-mortem 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, mostly well defined as a result of separating body parts; and taphonomic fractures in the form of grave marks from scavenging apes. A group of long bones with fresh spiral fractures challenged the investigator: 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): Vella, 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) - Karpina, Yuliya (Volga-Ural Center for Paleooarchaeological Research SSSPU) - Blockin, Jorgo - 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) - Schlegel, Stefan (Albert-Ludwige-Universität Freiburg - Department of Biological Anthropology) - Arslanov, Amilbek (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 interpretative 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 Tunnug1 (Tom, Southern Siberia – 2nd-4th C. AD). Analysis of trauma at this site was 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? Perimortem trauma were frequent in the sample? b) which demographic distribution characterizes the observed evidence? Presence of trauma was checked by means of logistic models and Fisher’s exact test. Perimortem trauma were frequent in the sample? b) which demographic distribution characterizes the observed evidence? Presence of trauma was checked by means of logistic models and Fisher’s exact test. 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 vertebra 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-
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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 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 203 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 perimortem 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.

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16TH-17TH CENTURY WAR-RELATED GRAVES AT THE VASTSELLINA BURIAL CEMETERY, ESTONIA  
MARTIN MALVE, UNIVERSITY OF TARTU, ESTONIA  
Abstract format: Oral  

Archaeological research excavations at the Vastsellina cemetery took place in connection to the building of the Pürg Hill of the medieval theme park at Vastsellina Castle. During the rescue excavations 143 burials were documented. The analysed sample from Vastsellina 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 trauma, demonstrating at least 98 cut wounds altogether. During the osteological examination, five skeletons had at least 98 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-mortal cut marks were also found.  

The discovery in Vastsellina is the third known mass grave of victims of violence and the first mass grave dated to the Early Modern Period in Estonia. 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 (1929-1940): THE HUMAN REMAINS' BURIAL AND STORAGE CONDITIONS INFLUENCE ON THE TRAUMA RESULTS ANALYSIS  
Abstract author(s): Drath, Joanna - Arcoiszewska, Joanna - Cytkalla, Sandra (Pomeranian Medical University) - Machalski, Grzegorz - Holicki, Mariusz (West Pomeranian Oncology Center) - Parafinski, Miroslaw - 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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 May 1945, 63,000 Poles were killed at the Stutthof concentration camp 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. Among the commingled remains two skulls with peri-mortem cut marks were also found.  

The Iron Age has been indicated as a period of high sociopolitical instability, resulting in different violent conflicts. Furthermore, the evidence of violent ritual sites and burials included 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 dynamics in the present context. In the present contribution, we analyse an adult female cranium dated to the 4th century BC from the Zerku cemetery (Dobrinja, Croatia). The cranium bears evidence of a cranial trauma that bears evidence of a 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 (Dpt. of Archaeology, University of Sheffield) - Riccomi, Giulia (Division of Palaeopathology, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa) - Tripodi, Paolo (Indipendent Research) - Aringhieri, Giacomo (Diagnostic and Interventional Radiology, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa) - Bombardieri, Luca (Dip. & Stud. Ummanistic, 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 taphonomic (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 exclusively dedicated 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 hypothesis of traumatic lesion and post depositional breakage. The post depositional process in prehistoric sites, such as that of Cyprus, variability 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.
analyze the number, the size and the position of the outmarks in order to determine the direction of the weapon, the type and the distribution of the injuries. We exclude the possibility of a judicial practice, preferring an interpretation of extreme lethal violence as a direct result of warfare or inter-personal conflict. Accordingly to the available historical information, the archaeological context and the skeletal evidence, we discuss the possible relation of the conquest of Euphrates by Sors in 1347 AD. The reconstruction of the skeleton's osteobiography is part of an ongoing research project that includes palaeogenetic and isotopic analysis.

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, SMM 22, sustained multiple massive blunt force cranial injuries that likely caused death almost immediately. The osteological analysis indicates that this individual was likely a scavenged for the town at a time where political change and social anxiety were rampant. The level of “overkill” that SMM 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 Orthodoxy 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 SMM 22’s burial and the pathological changes identified upon the skeletal remains, along with an isotopic reconstruction of the individual’s diet during life will be used to understand the circumstances surrounding their violent death.

NOVEL CROSS-DISCIPLINARY APPROACHES IN BIOARCHAEOLOGY

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

Organisers: Wärmländer, Sebastian (Division of Biophysics, Stockholm University; UCLA/Getty Conservation Programme, Costa Rica; Alvestad, Karl (Department of Culture, Religion and Social Studies, University of Southeastern Norway); Winter, Elise (Archaeological Researcher Norwegian Institute for Cultural Studies - NIKU)

Abstract author(s):Backhouse, Janet (Department of Botany, University of Edinburgh; Instituto de Etnologia, Universidad de la República; Universidad Complutense de Madrid); Tromp, Carolien (Department of Zoology, Australian National University; Erasmus University Rotterdam; Université Libre de Bruxelles); Zürich (Alvestad, Karl (Department of Culture, Religion and Social Studies, University of Southeastern Norway); Winter, Elise (Archaeological Researcher Norwegian Institute for Cultural Studies - NIKU)

Abstract format: Oral

This paper highlights cross-field examinations of an Oslo workhouse, Tukhuset (1741-1918). An associated cemetery, in use from ~1750 to 1920, was cleared in 1898 by archaeologists and untrained road workers: about 50 graves were previously removed in the 1950s. The minimum number of individuals is 310; with one-third fairly complete. Hundreds of elements are seen, consistent with use of cadavers for anatomical research and surgical training. Chronic infections such as TB and syphilis are observed, with TB cited a burial record as a common cause of death among inmates.

The study encompasses translations of magistrate trials and workhouse archival documents, historical research, genealogical investigation, biomolecular studies including stable isotopes and DNA, 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 magistrate’s trial that sentenced him and his wife to Tukhuset. An historian is working through 200-year-old documents to ascertain what inmatas 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 isotope 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 catalyzes and exemplifies cross-disciplinary research.

A CASE OF AMYTROPYTIC LATERAL SCLEORSIS AFTER EXPOSURE TO MANGANESE FROM TRADITIONAL MEDICINE PROCEDURES IN KENYA

Abstract author(s): Wärmländer, Sebastian (Division of Biophysics, Archean 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); Shotts, Sabrina (Department of Anthropology, National Museum of Natural History, Smithsonian Institution) and researchers at the college of Environmental Medicine, Karolinska Institutet

Abstract format: Oral

Amyotrophic lateral sclerosis (ALS) is an always fatal neurodegenerative disease of unknown cause characterized by motor neuron loss and widespread muscular atrophy. The cause of ALS is unknown, although genetic and environmental factors have been intensively 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 distorting metal plug into limb subcutaneous out 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 close relationship between the systemic exposure to KMnO₄ and ALS development is 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 traditional medicine.

ASSESSMENT OF CELLULOSIC-BASED PRINTING AND GRAPHIC ARTS SUBSTRATES OF KNOWN ORIGIN AND AGE VIA RESONANT CAVITY DIELECTRIC SPECTROSCOPY

Appendix: De Pace, Monique (University of Edinburgh)

Abstract format: Poster

Oral

Wärmländer, Sebastian (Division of Biophysics, Stockholm University; UCLA/Getty Conservation Programme, Costa Rica; Alvestad, Karl (Department of Culture, Religion and Social Studies, University of Southeastern Norway); Winter, Elise (Archaeological Researcher Norwegian Institute for Cultural Studies - NIKU)

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
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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, Allouan - Bouby, Laurent (CNRS, LIMR5654)
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 to be addressed are: how has agriculture evolved through time and space? What factors (e.g. socio-economic-environmental) have influenced this evolution? According to what models? 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 phenomics (through geometric morphometrics), database, archaeology, ethnozoology, 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 SKULL TUMORAL 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 task. 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 Venetian, who had recently originated in Scandinavia and the 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 aims 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 CÂNDEŞTI (ROMANIA)

Abstract author(s): Popovici, Mariana - Groza, Vasile-Monica (Rumanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research) - Petru, Oana-Maria - Bejeneru, Luminita (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research), Faculty of Biology, “Alexandru Ioan Cuza” University of Iasi
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 Cândești (Vrancea County, Romania) were examined. Considering that the skull is most commonly skull part used in ancient population studies, in our work only cranial metric data were used. Multivariate analysis was focused on the skull indices (according to Martin and Iliescu, 1965-1966) that have shown accuracy and confidence in the description of typological characteristics in previous our studies: cranial index (IC), basic-bregmatic-longitudinal index (17/31), basic-bregmatic-transversal index (17/80), proiro-bregmatic-longitudinal index (20/11), proiro-bregmatic-transversal index (20/98), gnathic index (40/10), total facial index (47/146), orbital index (52/61). Principal Components Analysis, used as an exploratory tool, highlights the existence of variation models attributed to some typological 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 Cândești. The presence of the Nordoid type morphometrics suggests that at least some of the individuals were assimilated and integrated by the main group of Monteith Culture.

This work was supported by a research grant made with financial support from the Reconsirng Fund, available to the Romanian Academy and managed by the “PATRIMONI” Foundation GAP-LM 2019-9-21-1-6.

478 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) - Cechura, 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 Sepulchre and subsequently the imperial chapel in Aachen, this special architectural type has spread especially between the 9th and 11th centuries, but examples are not missing outside this period. Round churches were built in very different contexts, over time with various functions: baptisteries, court/palace chappels (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 lots of questions to be answered regarding the circumstances of their life, the chronological and architectural frameworks of this 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, Pilzen)
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 and were associated with the spread of Christianity to Central Europe. Since the beginning of the 20th century, a 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 unconvincing. Similarly, Czech round churches are considered an inspirational source for other regions, especially Poland. The popularity of this building type ends during the 12th 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 BOHÉMIA

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 formation of these churches is dated to the era of the early Czech state, i.e. the late 9th/early 10th centuries. Thus, since the 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 and West. The article presents an inspirational source for other regions, especially Poland. The popularity of this building type ends during the 12th century.
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 analysis is based firstly on comprehensive catalogues of the Romanesque centrally-planned churches in the traditionally discussed region, secondly on the latest discoveries in the area.

**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 Pitești, Geamăni 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 colonized 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/COSMOMBOL (ALBA COUNTY, ROMANIA)**

**Abstract author(s):** Tarcoș, Petar Levante (County Museum Satu Mare, Romania) - Sebastian, Belba (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 data 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 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 rented by King Gáza I 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 ODOREIU SECUIESC**

**Abstract author(s):** Dumitrache, Marianne (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart - Esslingen) - Istrate, Daniela Veronica ("Vasile Pârvan" 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 Secuiescu. The settlement was a market-town during the Middle Ages, being one of the most developed urban centers in the Székelyland. The church’s layout is composed of 4 lobes symmetrically distributed around a 9,4 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’s, 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 findings of a post-1990’s excavations. The poster shall briefly present the historical evidence of the church types, synthesising hypotheses expressed based on archaeological and architectural data, by contrast with existing presumptions.

**6 THE ROUND CHURCH DISCOVERED ON PORUMBENII MARI (ROMANIA, HARGHITA COUNTY)**

**Abstract author(s):** Sofiáfi, András (Háza Rezsd Museum)

**Abstract format:** Oral

During this summer, in the course of excavations made in the medieval church of Porumbeni Mari (Halas Nagypalotafalva), remains of a round church were discovered underneath the gothic edifice. The first church interior diameter was about 6,5-6,8 m, with a smaller sanctuary, the walls were made from stone and brick, based on stilt clay (foundation wall). After the realisation 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 Porumbeni Mari is the only apsidal rotunda in the Szeklerland (Eastern Transylvania).

**479 CONSTRUCTIVE CONSERVATION: MAKING MONUMENTS USEFUL**

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

**Organisers:** Darvi, Timothy (Bournemouth University) - Sutton, Robert (Cotswold Archaeology) - Higglin, 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 recognising, 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 these. 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):** Darvi, 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 18th 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 ‘re-storing as found’; the idea of full-scale 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 trust 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): Hugle, 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 contradict their conventional conservation concept. They think archaeological heritage should be protected and if that is not possible to construct 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-located 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 under construction in England. These include roads, railways, power stations, 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 surround modern infrastructure: the Avon and Severn estuaries are split in two by a major road, the Severn tunnel crosses the river crossing, and Glasgow airport is situated close to the river Clyde.

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): Byrzwowska, Agata (National Instytut Dziedzictwa / National Heritage Board Of Poland)
Abstract format: Oral

In July 1999, the Krzemionki prehistoric striped flint mining region was inscribed on the UNESCO World Heritage List. The monument covers an area of 142.3 hectares and consists of four parts: the main mining field in Krzemionki, two smaller ones, a small dolmen field in Borowiak and a small dolmen field in Koryczna. The dwellings that are inscribed on the UNESCO list are 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: 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 surround modern infrastructure: the Avon and Severn estuaries are split in two by a major road, the Severn tunnel crosses the river crossing, and Glasgow airport is situated close to the river Clyde.

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.

5 THE ARCHAELOGICAL AREAS OF PRAQUE CASTLE: A LABORATORY FOR THE DEVELOPMENT OF METHODS AND DOCUMENTATION IN HERITAGE PRESERVATION

Abstract author(s): Tomášova, Pavla - Heričová, Iva - Marková-Kuklova, Jana (Institute of Archaeology of the CAS, Prague) - Šutihulková, Eva - Vejvola, 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 1290s and 1670s and each of them requires specific attention. Most these areas contain structures of limestone, sandstone, wood and the remains of terrain, such as earthen ramps. 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 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 (Institute fuer Un- und Fruehgeschichte Muenchen)
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 conscious experience of time, such as changes in aging, growing up with their “births” 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 that, in fact, 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.

480 HOW TO PROMOTE INTER- AND TRANSDISCIPLINARITY IN MEDITERRANEAN ARCHAEOLOGY?

Theme: 0. Theories and methods in archaeology: interactions between disciplines
Organising partners: Manuel J. L. (Politecnico di Torino, Italy; Universidade de Évora, Portugal), Rossa, 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 influence the analysis and potential further scientific research. Nowadays, a more integrated scientific research that involves a wide range of disciplines is needed.
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 trans-disciplinary in training and research. Only then, the full potential of collaborations between different institutions can be unleashed.

1 PERSPECTIVES FOR BENEIFICIARIES OF INTERDISCIPLINARY AND MULTICULTURAL EDUCATION IN CULTURAL HERITAGE SCIENCE

Abstract author(s): Fundurucu, Ana (Department of Environmental Biology, Sapienza University of Rome; HERCULES Laboratory, University of Evora) - Ortigueira-González, Álvaro (Independent researcher) - Lópes Aceves, Judith (Independent researcher) - Buttacharya, Srinadha (RAMAT-CRP2A UMR 5609—CRS—University of Bordeaux Montaigne, Maison de l’archéologie; HERCULES Laboratory, Department of Chemistry, University of Evora)

Abstract format: Oral

The European Educational system for Cultural Heritage ofers many opportunities to study in inter-disciplinary 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 generation 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 Evora (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 possibilities and perspectives of possible career paths? The newly created Archaeological Materials Sciences 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 to create an engaging and independent forum, that will detect main challenges, monitor the efficiency 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) - Barroes Dias, Cristina (University of Évora) - Aruda, Ana (University of Lisbon) - Magni, Donatella (Sapienza University of Rome) - Di Ritta, 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 working to match the changing socioeconomic 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 the period between the 8th-5th centuries BC is reconstructed using stable isotope (C, N, O, S) analysis of zoo-osteoarchaeological remains (bone and teeth). This study combines land management practices in the traditional morphometric and stable isotope analysis of the archaeological post remains (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 inhabitants lifestyle.

This research is hosted at Universidade de Evora (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).

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until now. The earliest evidence of Las Drogas document the settlement in the Berinjan Peninsula is dated at the beginning of the Neolithic (3500-2500 cal BC). The waterlogged sites of Las Drogas (Girona, Spain, dated 3500-3500 cal BC) and the well-known remains of the Coves de los Murciélagos in Alboró (Granada, Spain, dated ca. 3500-2500 cal BC) were until recently the only cases of neolithic plant-based crafts. The latest excavations in the Coves del Ferron d‘Ulladollers (Tarragona, Spain) have added new examples of plant crafts dated 4941-4645 cal BC. The site has provided several carbonised 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, collated methods are the only ones documented in all of three archaeological sites mentioned before. Regarding raw materials, several types of monoxotc 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): Martín Seijo, María (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 and everyday communities of northern Iberia. The first aim of this oral presentation will be summarising all kind of wood related to woodturning in the northern fringes 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 craftspersons. The integration of artisans in the study of the Iron Age material culture made of wood enclaves and expands the information provided by archaeological, archaebotanical 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 artifacts currently performed by craftsmen.

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, Maria (Universidade de Santiago de Compostela: GEPN-AAT) - Tereso, João (CIBIO - Research Center in Biodiversity and Genetic Resources, University of Porto; Centro for Archaeology, UNIRIO; School of Arts and Humanities, University of Lisbon; MHNIC - 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 various 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 us with direct evidence of this material, either carbonized or waterlogged. The application of archaeobotanical methods and conceptual tools to the analysis of these cases provides an opportunity to understand how wood was obtained, shaped and used in these archaeological contexts.

From cave 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, combined published and unpublished data, will be presented from the following sites: Arael, Sedace, As Laias, Nabas and Alto do Castro from Galicia (Spain) and Quinta de Crestelos, Castelmilho, Aque Flavia, Penedas and Castro 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 in 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 paper will require 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 those 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): Baruch, 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 belief's 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 1960's in Poland have been exposing archaeological remnants 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. Most popular were bowls which the uniformisation observed in woodworking, such in different branches of craft, is associated with specific work organisation, introduced in medieval towns (in Poland from 13th century).
to research just material evidence of human history. The oldest one is 8200 hundred-year-old logboat from Pesse and about 12ky old artefacts from when Australia was colonised at that time, with crossings to Suhai in EW. Anthropological theory predicts the use of EW by Homo Erectus 800k years ago through the evidence of migration. EW is researched also by ethnohistori- document and describe all kind of HW around the world exist even today in many societies and building as was built by our ancestor several thousand years ago. Without changing the technology of building, unfortunately, at 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 diachronous 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 (Rossmich-Germanisches Zentralmuseum; Leibitz- recherche Institute for Archaeology; Department of Prehistory)

Abstract format: Oral

It is largely accepted that besides 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 gleaning and sawing. 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 sawing 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); Groll, Daniel (Centre for Baltic and Scandinavian Archaeology; DRO 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 Douvres, Germany show that the network of waterways was not only used as a means of transport, but was also actively navigated by boats, even though these vessels have not been recorded archaeologi- cally earlier than from the later Boreal. Using south-east Holstein in northern Germany as an example, we will discuss the use of the landscape at that time by hunter-gath- erer 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 AND COLLECTING AND PRESENTING DISPERSED AND UNVISIBLE OLDEST HUMANKIND INVENTION

Abstract author(s): Eric, Miran (Institute for the Protection of Cultural Heritage of Slovenia); Antlaj, Kaja (Deakin University); Rebennik, Natasa (University of Deusto); Cartledge, Kay (Our Songline); Jaklif, Lalan (LaniXl.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 Envi- ronment (GWVCE). Since EW is a shared and inclusive heritage, it can serve as a bridge between different locations, countries, cultures 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 computerindia 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 Hotza 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.
Oral Ventós, Gerard - Cabezas-Guzmán, Gerard (Universitat de Girona)
Oral Matic, Uros (Österreichisches Archäologisches Institut)
Busset, Anouk (University of Glasgow; University of Lausanne)
Johnson, Andrew (Manx National Heritage)

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 seen as a strong reminder of the management of its permanent subjects. In between Rome’s crushing of a major Iberian uprising (195 BCE) and the outbreak of the battles, the management of its permanent subjects. In between Rome’s crushing of a major Iberian uprising (195 BCE) and the outbreak of the battles, the

The archaeological study of conflict (from battles and 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 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 pattern? 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 late modern period, as we aim to have a wide range of contributions that provide elements for comparison and wider reflection.

**Abstracts**

1. **PHAROANIC 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
   - **Abstract:** 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 a cultural 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 enemies in the so-called “tribute scenes” in the tomb of Eighteenth Dynasty officials. 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 CETERIOR (195-81 BCE)**
   - **Abstract author(s):** Vintó, Gerard - Cabezas-Guzmán, Gerard (Universitat de Girona)
   - **Abstract format:** Oral
   - **Abstract:** 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 BCE), a new reality emerged in northeast Hispania Ceterior 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 areas 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’Famà; and finally El Camp de les Lloses.
In this paper, we aim to argue that Rome’s undetermined forms of addressing its subjects in post-war scenarios brought about the rise of ‘liquid spaces’. These local elites not only sided with Rome but were progressively integrated into new realities, while native life-styles remained as strong as ever. Such ‘fluidity’ eventually drove into a two-directional identity formation process: Roman Iron Age traditions and their material culture definitively influenced any Romans and Italians who lived nearby, whilst the same process seemed to occur in the other way around. The (asymmetric) symmetrisation between both cultural realities hardly changed until the aftermath of the Sertorian War, when such territories were ultimately accommodated in a unilateral Roman model of provincial management.

3 RESISTANCE, RECOVERY, REBELLION: THE MIDDLE RHINE-MOSSELLE REGION BETWEEN CAESARIAN CONQUEST AND THE BATAVIAN REVOLT

Abstract author(s): Fernandez-Gitz, 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 González-Ruibal’s (2014) terminological distinction between ‘resistance’, ‘resilience’ 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): Reijnders, 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 (59–51 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 disintegration. 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, archaeologically 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 (Tintumont 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 the perception of post invasion aftermath that was not entirely fictional to Tacitus. It may also be a process that we 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 invasions worthy of the title “War”. But much of this negotiation is borne out by the evidence from supra-mural Britannia and was “desolatio” 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): Hartz, Eyvind (Museum Skanderborg) - Munch Kristiansen, Ben (Aarhus University, Geosocience)

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 Aaken Enge site next to present-day Lake Mosegaard evidence the post war aftermath. Traces on-site are especially indicators to new rituals of sacrifice of minimum 980 individuals under the influence of Celtic tradition and religious practice. In this hithertofore studied the paleo-landscape give indications of why Aaken 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 studies indicates that the post battle land-use rapidly transformed from grazing and farming into forest af ter the deposition of the dead warriors. In a regional perspective, conflict related sacrifices continue from 200 to 450 AD in another mirror lake upstream in the IJærup valley, now with a focus on the weapons and warrior’s personal equipment. Weapons sacrifices in IJærup 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 IJærup 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 Scandinavians. But perhaps there is an intermediate alternative to this polarization. Written sources, which discuss Scotland throughout the ‘900s 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.


Abstract author(s): Kolláth, Ágnes (Institute of Archaeology, Research Centre for the Humanities)

Abstract format: Oral

Székesfehérvar lies between Budapest and the Lake Balaton, on low hills emerging from the surrounding marshlands. It has been an important spiritual centre of the Hungarian Kingdom since the 11th century, as the coronation of the kings was valid only if it happened here. The Procvat Church of the Virgin Mary was also one of the prevalent royal sepulchral places, as the first Christian king, Saint Stephen (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 (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 waned as well, as a garrison guarding the main road to Buda, the capital city.

Székesfehérvar has been captured for a short time by Maximilian Habsburg I in 1490, then by the Ottoman armies led by Sultan Süleyman I in 1563. The most catastrophic siege happened in 1601, when the Christian armies reconquered the settlement, but an explosion and the following fire ruined it almost entirely, including the Church of the Virgin Mary. It was lost to the Ottomans again in 1620 and captured 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 Székesfehérvar has eventually paid off, as the town remained an important regional hub in Hungary to this day.

NAPOLEONIC BATTLE IN ROGOŽNICA (STRZECOM COMMUNE) - RESULTS OF GEOPHYSICAL AND ARCHAEOLOGICAL RESEARCH

Abstract author(s): Zděk, Katarzyna (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw) - Biż, Jęnuta (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 battles as well as determine the place of their remains. Archaeological research is irreplaceable for the reconstruction of geographic – 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 Russian-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.

MEGALITHS ON THE EDGE: THE PLACE OF CULTURAL TRANSFORMATION
Theme: 1. Networks, networking, communication: archaeology of interactions
Organisers: Higginbottom, Gail (Incipt, CSIC) - Diaz-Guardamino, Marta (Durham University) - Tejedor, Cristina (Incipt, CSIC)
Format: Regular session
This session wishes to address approaches and interpretations that determine understanding 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 communities/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 have often 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 places and places you are studying in relation to the Atlantic from just prior to, during or after the adoption of megaliths? Your research focus, ‘place’ could even be just next door but the adoption didn’t actually happen. Can you tell us why?

RECONSTRUCTING THE PAST – A PEAT COVERED FUNNEL BEAKER LANDSCAPE IN LOWER SAXONY, GERMANY AND WHAT IT REVEALS
Abstract author(s): Behrens, Arja - Mennenga, Moritz (Lower Saxony Institute for Historical Coastal Research)
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 39,000 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 continuity, this monolithic landscape has 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 these 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.

PASSAGE TOMB PEOPLE: EXPLORING INTERACTION ACROSS THE IRISH SEA
Abstract author(s): Smyth, Jessica - Pigire, Fabienne (University College Dublin) - Diet, Lily (University of Bristol) - Maddick, Richard (Cardiff University) - Buckley, Michael (University of Manchester) - Evershed, Richard (University of Bristol) - Downes, Jane - Mainland, Ingrid (Oxford College, UH)
Abstract format: Oral
Scholarly interest in passage tomb 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. Eroded 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 (ERC Laureate 2019-2022) 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, successfully meeting 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 radionuclide dating of bone and absorbed pottery
THE ROLE OF ROCK ART IN CULTURAL TRANSFORMATION IN PREHISTORIC SCOTLAND

Abstract author(s): Higginbottom, Gail (El Instituto de Ciencias del Patrimonio - Incipit, CSIC);
Brinkmann, Johanna (Institut für Ur- und Frühgeschichte Kiel);
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, it also known that some late Neolithic 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 unrecorded and documented, contributing significantly to a better understanding of the rock art in this country. A recent study has suggested that the open-air carving tradition was entangled with a wider phenomenon that spread along the Atlantic seaboard through networks of exchange and cultural transmission (Higginbottom 2013). 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 Durness and Gallay, for example, we examine the transformative potential of cultural connectivity within Scotland and in the wider Atlantic region.

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 reports 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, and 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 immersive 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 those variables will evidence for the Neolithic megallithic architecture and cultures across the seas, and possibly the relationship between Time and Death was seen differently, by those of the Earlier Neolithic.

STONE-COLD SOBER: RE-EVALUATION OF ESTABLISHED THEORIES ON MEgalithic MONUMENTS BETWEEN THE ATLANTIC FAÇADE AND THE BALTIC SEA

Abstract author(s): Birkinmann, 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 accorded various roles in these theories. E. g. in Renfrew’s 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 agriculturalisation 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. Sherratt 2001). The evaluation of these theories indicates the importance of specific premises are often predisposed and implicit concepts are not reflected (e. g. the predominance of inter-group comparison 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 4000-1800 BCE, an evaluation by means of archaeological evidence is conducted. Focusing the variability of the megalithic tomb and the associated material phenomena, it becomes apparent that they can also be understood in their specific archaeological context.

STUDIES: revealing prehistoric shared worlds along Europe’s Atlantic façade.
MEDIEVAL ISLAMIC FORTRESSES: ARCHAEOLOGICAL EVIDENCES OF ENTWINING CULTURES

Abstract author(s): Sarciniotti, Irene (University of Primorska)

Abstract format: Oral

The comprehension of the historical phenomena and driving forces that led to the development of the medieval Islamic 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 chronological sources, it is hard to retrace it from an archaeological point of view. In this regard, too 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 methodological studies by H. Haniouch, this paper proposes an original research on the archaeological evidences of Armenian masons’ contribution to Islamic military architecture in the medieval Islamic world, with particular reference to the citadels of Haran and Biharq, and an overview of the main open issues regarding the subject.

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 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 outlying 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 learn more about the character of the town’s economies and network.

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 Scandinaivia, 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, 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 (trading, gift-giving, missioning etc.), the meaning of the ‘foreign’ objects within Scandinaivan societies forms a key aspect of their analysis.

Focusing 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 Scandinaivan societies of the Viking Age dealt with these tangible results of their far-reaching interactions.

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 Sunnmore 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 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 pots of different 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 an Linked Open Data. Several methods of finds analysis, such as the observation of spot 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.
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-Tulliet, 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 with 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.

ETHNOARCHAEOLOGIES. THEIR PAST AND RECENT ACADeMIC, SOCIAL AND POLITICAL RELEVANCE

Abstract author(s): Marianciak, 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 1990s 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 at the beginning of the new millennium. The first objective was to demonstrate the importance of non-Anglo-Saxon 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.

PRESERVATION OF ARCHAEOLOGICAL HERITAGE IN RUSSIA IN THE XXI CENTURY: LEGISLATIVE REGULATION AND PRACTICE

Abstract author(s): Engovatova, Aya (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 archaeology, changing the ratio of scientific research and rescue. Russian archaeologists become members of international organizations, including EAA. The exchange of experiences 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. EAA conferences especially helped the Russian archaeologists of the in resolving issues associated with rescue archaeology, preservation of archaeological sites, building the structure of organizations, including commercial archaology.

Improvement of Russian legislation in the field of archaeology 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 new provisions of the Valletta Convention into Russian law.

Thanks to the legislative measures taken, the number of archaeological investigations in the country has increased sharply - actively conducting research, proceeding major construction work, during which hundreds of new monuments are revealed. Currently, a large part of the staff of the Institute of Archaeology 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.
ABSTRACTS

1 HOW CITY SHAPE TIME? ORIENETATIONS, SKYSCAPE AND URBANITY IN ARCHAICA CAMPAANIA

Author(s): Cristofero, 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 same cities layout functioned as a calendar: by founding the city sighted 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 was followed by Latin sources for Roman cities as a way to reflect the divine order in the urban space (Dargi 2017, 172), the attempt is to verify a similar pattern where no or little literature is available, but by reconstructing ancient landscapes and skyscapes (Zottaroli 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, Naapolis, and Heracleaum. 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 a calendrical ritual time was encoded in the architectural urban scheme, investigating how the act of foundation conditioned together spatiality and temporality, ritual and cyclical performances, skyscapes and urbanity.

2 APOGEE, DECAY AND TRANSFORMATION: A SEDIMENTOLOGICAL STUDY OF THE TEMENOS OF THE ARTEMISION OF EPHESUS

Author(s): Lourenço Gonçalves, Pedro (UAI / IGAW)

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” (UAI/IGAW), 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 Seljuk/Ottoman rule. Since its rededication 1250 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 geologic 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. Eturia 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 Tymbranean plain, 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 montaneous 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 Orientalizing period.

4 SACRED LANDSCAPES IN GREEK SICILY: URBAN AND SANCTUARY NETWORKS IN EASTERN SICILY BETWEEN THE 8TH AND 6TH CENTURIES BCE

Author(s): Brancauto, Rodolfo - Platania, Erica (University of Catania) - Santospagno, Paolo (Freie Universität Berlin) - Scaravelli, Mario (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; comparative 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 only not. 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): Lahenth, Christoph (Rhönisches 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 sanctuaries. The Chen near 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 Marscusa close to Minturnae, continuous 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, reflects agency of Roman citizens or members of different political or ethnic groups. This shall be achieved by analysing the architectural remains, the infrastructural embadment of the sanctuaries, votive material and inscriptions, hoping to reveal the spatial relationship between colonies and sanctuaries, the composition of the group of dedicaters 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): Klöse, 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 figure Battos Aristoteles, who founded the city allegedly around 631 BCE. This influence is represented in the city’s main sanctuary as well as the agora, with two temples dedicated to Apollo and a haven 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-oleistai.
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, the Karpas region severely damaged by a Jewish upheaval which targeted and destroyed buildings seen as hallmarks of greek-roman culture, especially sanctuaries. In its aftermath the religious landscape of Cyprus 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 of religious development and whether it was not in fact much more novel than the shape in which it came.

7
URISTOMTALS AND BRONZE AGE HOARDS. NATURAL LANDSCAPES AND CULTURAL PRACTICES AND THEIR AMAZING CONVERGENCE IN VARIOUS REGIONS OF POLAND
Author(s): Mociejski, Marcin (Institute of Archaeology Mania Curie-Skłodowska University)
Format: Oral
Mobility is one of the hallmark 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 Etnved girl), which enables us to look at the movement from the perspective of individuals, confirm its 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, gives us the possibility to understand how the deposition sites of metal artifacts shaped the Bronze Age landscape. Finds from Rosiko i 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 functional 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 Valno 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 fusion in which the ancient heritage coexisted, reworking them, with the innovations of western Latium. In this cultural dialectic the prestigious Etruscan bronze goods are inserted, regulated by the economic mechanism of the gift (hospital, 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 parsolia had already reached these statuses of privilege and in turn had already metabolized cultural dialectics with the Greek world.
This paper presents a methodological focus and will show how larger amounts of complex and diverse provenance analysis can be gathered and standardized in one GIS database, which makes a wide range of geographical and statistical analyses possible. The standardization and generalization can be done in a wide variety of ways, each having its advantages and disadvantages, some of which will be targeted in the presentation.

WHERE IS THE FOCUS OF ATTENTION? AN EYE TRACKING STUDY OF STONE TOOLS

Author(s): Silvia Gago, Maria - 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 channeling 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.

LOWER PALEOLITHIC STONE TOOL HAPTIC EXPLORATION AND SEXUAL DIFFERENCES IN EROGONOMICS AND FINGER FLEXION

Author(s): Fedato, Annapaola - Silva-Gago, Maria (Programa de paleobiologia, Centro Nacional de Investigación sobre la Evolución Humana, Burgos) - Terradillos-Bernal, Marcos (Universidad Internacional Isabel de Castilla, Burgos) - Alonso Alcalde, Rodrigo (Museo de la Evolución Humana, Burgos) - Bruner, Emiliano (Programa de paleobiologia, 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 archaeological 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.
ABSTRACTS

11 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 archaeological theory and archaeology: “there is, therefore, a brilliant opportunity for anyone who can command the data and a scholarship of archeology while employing the problem-orientation and research methods of current anthropological archeology.”

Whether Renfrew’s dictum is true remains a question for debate, though from the perspectives of social scientists and those in the humanities, scientific approaches to archeology can appear distant, confusing and aloof. Whilst it certainly has the capability to answer questions of real archeological significance, all too often, science-led archeology “betrays a lack of concern 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 dictum into an opposition between grand theory and abstract empiricism. Where the first ignores real-world problems in favour of theoretical models, and the second focusses 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-frame, is lacking. And that such a strategic approach needs 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: General session - anthropological archaeology
Chair: Bartosiewicz, Łaszłó (Stockholm University)
Format: Regular session

ABSTRACTS

1 INTERDISCIPLINARITY TO AID ARCHAEOLOGICAL ANALYSIS OF ANIMALS IN EGYPT AND NEAR EAST

Author(s): Grandsard-Desmond, Jean-Olivier (ArkeoTopa, 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 iconographical features of handaxes and worked pebbles. Differences between males and females are significant for both stone tool type, although with distinct grasping patterns.

2 ORNITHOMORPHIC IMAGES IN THE UPPER PALEOLITHIC (MAL’T A BURET’ CULTURE, SIBERIA)

Author(s): Pokińska, Anna - Libova, Ludmila - Kazakov, Vladislav (Novosibirsk State University)
Format: Oral

The most ancient bird images in the archaeological record belong to the Upper Paleolithic sites such as Hôôî Fels, Dobr Vlastonice, Mozino, Mal’ta and Burid. The largest collection of ornithomorphic sculpture is represented in the materials of the Mal’ta-Buret’ culture (Bakalá, Northern Eurasia). This collection includes 21 figures of the complex. Numerous investigations of the ornithomorphic sculpture and analysis of the bird image semantic are based usually on the ethno-archaeological parallels. One interpretation is that those figurines were personal amulets, used as pendants and related to solar and celestial symbolic (Formozov, 1990; Shmidt, 2006).

Modern researches have a new look at the question of the interpretation of this collection with the application of microscopic and trascendental analysis and analysis of the archaeological context (Libova, Volok, 2015). A historical semantic approach explains the meaning of the archeological 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 workshop 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 breakage mutual-function of the sculptured pieces is confirmed by the icono-graphic features.

These provisions allow us to call into question the hypothesis (Formozov, 1990) or 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-term 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): Zivilevič, Ieva (BioSense Institute, University of Novi Sad) - Dimitrijević, Vesna (Laboratory for Bioarcheology, 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 Bioarcheology, Department of Archaeology, Faculty of Philosophy, University of Belgrade)
Format: Oral

Over the last couple of decades, extensive archaeological and DNA studies have securely placed the origin of animal domestica- tion in the Middle East. From this area, humans and domesticated animals (sheep, goats, cattle and pigs) gradually spread to the Balkans, and ultimately to the rest of Europe. Nevertheless, the faunal record from the Early Neolithic (c. 6500–5600 cal BC) sites in the Balkans indicates that this process had been far from uniform. These seem to have been pronounced regional differences in harding 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 toward caprivines, whereas in the latter, in addition to sheep and goat, cattle had been 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 in- sufficiently studied from an archaeozoological perspective. By comparing taxonomic compositions and mortality profiles of domest- ico-animals in the two studied regions, we try 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 MEZHYRICH CULTURE IN MIDDLE DINIEPER BASIN (UKRAINE)

Author(s): Shlykovsky, Pável (Taras Shevchenko National University of Kyiv, Ukraine; Center for Paleoethnological Research) - Pías, Stéphane (Muséum national d’Histoire naturelle, Paris - Tovúk, Ostąg (Institute of Archaeology, National Academy of Sciences of Ukraine, Center for Paleoethnological Research) - Čmerys, Mahałtya (Taras Shevchenko National University of Kyiv; Center for Paleoethnological Research) - Manču̯bor, Bohdan (University of Ferrara; Center for Paleoethnological Research)
Format: Oral

In recent years, the Epigravettian 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 fire, animal bones and skins has been identified. The structural features of the building are characterized by symmetry and rhythm. In this use of large mammoth bones, which makes up the basement of structure, exterior cladding and upper roof overlap that fall inside. The archaeological structures around the dwelling have different specific functions (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 data record, 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 240 BP. This conclusion provides a unique opportunity to reconstruct some
features of spatial behaviour of the hunting groups, which had a centralized logistic character. Base camps were arranged in the
centre of the seasonal movements of the group, in the most convenient places.

The current level of study of Epigravettian sites of the Middle Dnieper basin allows to create a model of settlement patterns of
Upper Palaeolithic human groups and to reconstruct several levels of use of the surrounding space.

5 NON-ECONOMIC USE OF ANIMALS IN THE EARLY IRON AGE CENTRAL BALKANS: THE CASE OF THE ST. JUNKARA - ZEMUN SETTLEMENT

Author(s): Bulatovic, Jelena (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Spasic, Milos (Prehistorlic 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 Stojunkara 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 Kalakaja/Bosut IV communities. The Stojunkara – Zemun settlement consisted of several solid above-ground, rectangular, wattle and daub houses, pits and silos. 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 Stojunkara 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 Classical Archaeology in Catalunya)

Format: Oral

Hunting had been an additional source of subsistence in many agro-pastoral 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 iconographic art of the Mycenaean world, 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 Mycenaean 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 Mycenaean with the wild animals can provide a deeper insight of the role they were considered to have in every-day life and on the symbolic level for the LB1 societies of the Aegean.

a. STUDY OF THE IDENTIY OF A BRETON Mammoth FROM ATTENDED TUSK PIECES TOMOGRAPHY

Author(s): Barreau, Jean-Baptiste (Univ Rennes, CNRS, CIfaAAnn UMR 6566, Rennes) - Le Mair, Mikael - Bourbouze, Gaël (CRT Morbihan)

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 Normandy-Bretagne 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 a large tusk of a mammoth (Mammuthus meridionalis antiquus). The tusk, ca 15,000 years old, is very large, and comprises five parts. Despite the lack of certainty concerning the age of the site, it was clear that the tusk was the result of the intervention of a human. A tomographic scan using a 3D scanner was performed on the tusk. The analysis of the data was performed using various software packages that enabled to determine the identity of the taxon.

504 GENERAL SESSION - HERITAGE IN FOCUS

Theme: 5. Sustainable archaeology and heritage in an unsustainable world

Chair: Willisk, Katalin (Independent researcher)

Format: Regular session

ABSTRACTS

1 UN-INSPIRED: WHERE IS THE SPATIAL DATA INFRASTRUCTURE FOR HISTORIC ENVIRONMENT DATA?

Author(s): McKaigie, 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 environment-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 a network of 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 preserve with project-focused approaches that fossilise valuable spatial data to the printed page or PDF rather than utilizing 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, suited to long-term digital preservation.

Issues of archiving are being addressed through the Saving European Archaeology from the Digital Dark Ages (SDA) Action, whilst the ARADINE 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 zoology 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, Ali (Lebanon Mountain Trail Association; University of Cologne)

Format: Oral

The western mountains of Lebanon contain hundreds of archaeological and 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.labonnotrail.org). To study its immersive 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 (Volkonskii 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 hedges 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 centralise 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 WWII 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 often 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.

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 RhubarbMHz, 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.

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 these 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 and archaeologists 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 focused on delivering public value.

FAME members work in partnership with local government archaeological advisers who ensure that each project is aligned 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 (e.g Cambridge to Huntington 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.

BRINGING A RUIN TO LIFE WITHOUT BEING RUINED - PROJECTION BASED IMMERSIVE EXPERIENCES ON A SMALL BUDGET
Author(s): Lindblad, 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 architectural 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 visualisations.

Digital immersive experiences, though VR, AR and projection-based, are used to create 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 five 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 an atmosphere of multi-sensory and truly immersive experience.

ARCHAEOLOGICAL HERITAGE PROTECTION AND MANAGEMENT IN THE BALKANS
Author(s): Lafa, Olis (University Aleksandar Moisic, 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 Valtelline and Faro conventions, and the concepts of preventive archaeology and heritage communities, which have encouraged a more holistic and participatory approach to heritage management. This chapter aims to analyze the legal approach to heritage taken by Balkan 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 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.

HERITAGE AND THE CONSTRUCTION/DECONSTRUCTION OF NATIONAL BORDERS: THE REDES ANDINAS EXPERIENCE
Author(s): Santaray, Thibault (Incipit-CSIC)
Format: Oral

As an instrumentalization of the past, heritage has contributed to the formation 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 definitively 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 in the landscapes. Moreover, it allows us to think how heritage may not only divide, but also draw alternative lines.

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 - Antoli, Giliberto (Department of Geosciences, University of Padova)
Format: Poster

MineHeritage is a Widler 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. This 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 multi-level 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 be able to 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) - Takaï, 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 Takaï 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 Zimman 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 En Gedi in Israel and the vicinities of the Hippos site.

Known as ALMAP tentatively, this is an ongoing 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 models of the city (SOMOD 1.500) and each building (SOMOD 1.100). For young Japanese students, the study of classical history and archaeology of Israel is a faraway phenomenon. The method relies on the photos and figures in the excavation report along with the relevant data from their daily life, such as apartment, household, shopping, school, etc., lead them to raw 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 analyze them from a broader perspective using daily life experiences. This study also encourages students’ motivation to learn more about historical backgrounds.

This method is not limited to the study 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): Kalábková, Pavlina (Palacky University Olomouc) - Vrostovská, Ivana (Palacky University Olomouc)

Format: Oral

The discoveries at Mohelnica 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 Uhrov 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, taphonomy, lithostratigraphy, palynology, archaeobotany and palynology, plant macroremains and mosses, zoology and zooarcheology 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): Doloburova, Ekaterina (The State Hermitage Museum, The British Museum) - Kittel, Peter (University of Lodz) - Mezuberovicht, Andrey (The State Hermitage Museum) - Włoszczowska-Lüth, Magda (University of Kiel) - Pawełowski, Dominik (Adam Mickiewicz University) - Gauthier, Emilie (UMR CNRS 6249) - Krapić, Marok (ADH - University of Science and Technology) - Mairgrot, Yolane (UMR 8225 Trajectoria) - Szmanda, Jacek (Pedagogical University of Cracow) - Mroczkowska, Agnieszka (University of Lodz)

Format: Oral

The paper presents the results of interdisciplinary study on cultural layers from Neolithic wetland multilayer site, Betroka 11/2 (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, Olsodoora, Chromididae, geochromatography 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 Betroka within a very vivid waterscape milieu, changing from lagoon conditions, swampy areas and to riveine 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 palæolake level changes in the shore zone influenced palaeoeconomical activity of local Neolithic societies such as gathering of plants (as dietary component and for medicinal use), fishing activities, and probably also have been important for funerary 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, 6.0 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, palaeoenviromental, and palaeoethnobotanical research in the vicinity of the former Malët 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 archaeological data for the Early Neolithic site of Vashëtini and the Neolithic to Early Iron Age lake-side 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 Vashëtini, 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 Kërpa, 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): Salamon, Geza (Center for Prehistoric Research)

Format: Oral

The Balkans is commonly recognized as the mountainous region, but the valleys, wetlands and lakes are frequent landscape features. Although not considered as significant as dryland areas in the archaeological research, the wetlands and lakes were preferred environmental setting for the Neolithic communities. 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, flooded 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 of Neolithic settlements of Sovjan, excavated as part of the Mission Archéologique Franco-Albanais du Bassin du Kërpa, 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.
the Pleistocene.

are in biodiversity hotspots within tectonically active regions characterized by shifting paleogeographic configurations throughout

hypothesis. These finds have implications for the biocultural evolution of the genus Homo, and suggests that seafaring may be a
different islands in the Eastern Mediterranean and Island Southeast Asia have provided impetus to revisit the hominin seafaring
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The hypothesis that our hominin ancestors could consciously decide to cross open water has remained a central topic to anthro

6 FLOOD RISK OF AN ANCIENT RIVER. THE CASE OF THE SANCTUARY OF AMPHIARAOΣ AT OROPΟΣ

Author(s): Androviotou, 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 ef-
flict 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 AmphiaroΣ 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 normal section and flood the surrounding areas, includ-
ing 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 aqua-
duct 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 for 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 find-
ings 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 anthro-
pological 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 specu-
lation 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 barrier for measuring human behavioral modernity. Here, we provide a summary of discoveries that support the early hom-
in 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): Forencz, Laszló (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 handled monastic properties, 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 clear-
ing), so as to Concerning Cistercians in Hungary (and more broadly in Central Eastern Europe), there is a limited knowledge on the land-
scape impact of Cistercian settlement. Archaeological investigations of Cistercian sites in the past typically had limited agenda,
fo...
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 87Sr/86Sr may shed light on their migratory history, therefore, giving an overview of the migration 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 unearthing 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 relationship 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. Our 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 assembly in order for such evidence to be accepted as an accurate record in legal contexts. Such digital recordings allow permanent preservation 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): Andreassen, 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 non-calcareous soils can substantially change the strontium isotope compositions of these waters. Waters unaffected by agriculture in western Denmark have an average 87Sr/86Sr of 0.7124, whereas waters from nearby farmlands have an average 87Sr/86Sr of 0.7097. Moreover, a systematic investigation of a 1.5 km segment of a river originating in a forest—Kaup A, shows that 87Sr/86Sr decreases 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 90 ponds and lakes examined in areas with similar geology, 26 were 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 non-calcareous soils should be reassessed, however, the diet still hold valuable information. For example, reinterpreting the iconic Bronze Age women at Egved and Skjettnes, indicates that it is most plausible that these individuals originated close to their burial sites. Yet the results are in particular, the Egved Girl, 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.
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 CEDOC CRM standard of the European Federation of Museums. The area of the present day Austria served as a case study and the data pool consists of about 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.

2 TAPHONOMIC STRUCTURAL CHANGES OF ARCHAEOLOGICAL HUMAN HAIRS DISCOVERED IN IASI (ROMANIA): A MICROSCOPIC ASSESSMENT

Author(s): Petruro, Ozana-Maria ("Alexandru Ioan Cuza" University of Iasi, Faculty of Biology, Romanian Academy—Iasi Branch, "Olga Necrasov" Center of Anthropological Research); Groza, Vasilica Monica (Romanian Academy—Iasi Branch, "Olga Necrasov" Center of Anthropological Research); Neagu, Anca-Narcisoa ("Alexandru Ioan Cuza" University of Iasi, Faculty of Biology); Bejenaru, Luminita ("Alexandru Ioan Cuza" University of Iasi, Faculty of Biology, Romanian Academy—Iasi Branch, "Olga Necrasov" Center of Anthropological Research)

Format: Poster

During the archaeological excavation at "Adormirea Maicii Domnului” Roman Catholic cathedral of Iasi (Romania), 113 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 saw 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 microbiological agents are statistically significant. Image analysis results of the internal degradation of hairs were correlated to external lesions. We propose 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: Herald, 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, Dulcinéia (EPA)

Format: Oral

This communication aims to synthesise 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 analyse 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 analyse 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) or (ii) those that seem to incorporate the container in a 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.

4 HOW DID THE ROMAN FORT IN APSAROS FALL? NUMISMATIC EVIDENCE FOR THE BORANOI SEABORNE INCURSION IN COLCHIS

Author(s): Jaworska, 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 Tapa'azus, 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.
The Neolithic Landscapes: 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 Tempa and Gordon Chihe 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 corollaries, mapping cultural groups and environmental regions with definitive boundaries. The new concept of landscape theory in connection with system and entailment, 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 as Northeast Hungary many microregions coexisted in every archaeological period with different ecological backgrounds and social-cultural traditions. Pogđ 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 specific strategic position. Many other microregions, like Főszécsény, Rétőcs, Bodrogzich, existed in the Neolithic period and had diverse cultural identity. Creation of these identities were running parallel 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 also created by humans because of the environmental restrictions.

Use of Plants during the Linear Pottery Culture: New Archaeobotanical Studies from the Southern Areas of Poland

Author(s): Musial, Danylo; Magdalenka (W. Szaflar Institute of Botany, Polish Academy of Sciences) - Litynska-Zapecz (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Kacprzak, Magda - Korczynska, Marta (W. Szaflar Institute of Botany, Polish Academy of Sciences) - Konig, Robert (W. Szaflar 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-Sklodowska 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 origin. Southern Poland belongs to one of the earliest regions occupied by the Neolithic groups and constituted one of the easternmost 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 (Módviczka site 4, Spyckowice site 26, Tommy site 6 and Jaszków site 1 and 46). The results were compared with other Polish and European archaeological 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 borderlines of the loessic and the sandy-clay areas.
TUNNUO 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 "Skythian" burial mound Tunnu 1 in Tuva Republic has started to unravel 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 Turko 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.

PARTS OF MONTEFORTINO HELMETS IN THE SANCTUARY GURZUFSKOE SEDLO: THE PARALLELS TO SARMATIAN "RITUAL HOARDS" IN THE NORTH PONTOIC 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 Taursia, and the findings 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. The significant part of the considered finds in the area were found in so-called 'ritual hoards' of military items of the second-first centuries BC associated with cult rites of an early Sarmatian. 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.

VETTERSFELDE-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 1892, in the north of Lower Silesia, near the Vetterfeldes field (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 Sarmatian 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 sword-shaped plaque indicates a clear Greek influence in 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 common forms for Iberian manufactures. Among the most expressive means are pairing, symmetry, repetition and antithesis.
The work was supported by the RFB grant No. 40031.

510 GENERAL SESSION - ARCHAEOLOGY OF THE CARPATHIAN BASIN
Theme: 6. Embedded in European archaeology: the Carpathian Basin
Chair: Récz, Zsófia (ELTE - Eötvös Loránd University, Institute of Archaeological Sciences, Budapest)
Format: Regular session

1 FROM THE HUNNIC TO THE GEPIDIC PERIOD? THE CASES OF THE CEMETERIES OF ÁRTÁND
Author(s): Kiss, Attila (MK, PPKE Archaeological Institute)
Format: Oral

The cemeteries around Ártánd (Hungary, Hajdú-Bihar county) have long been known in archaeological research of early migration period. Unfortunately, only two of the four known archaeological sites (Ártánd-Lenccsödomb, Biharkeresztúr-Toldi út) have been fully published. The evidence and system of customs found in 5th century cemeteries of Ártánd Kő- and Nagykarskombókamiarst városátóly) identifies the material culture of the 5th and 6th century. These cemeteries were open 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 (Nagykarskombó and Lencsödomb). Though the earlier burial can be dated back to the mid- and second half of the 6th century, 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 shown by the material culture of the 5th century, which could be dated back to the second half of the 5th century. The ethnic interpretation of these burial sites, which is also supported by the knowledge of the Gepids’ residence after 454. On the other hand, the cemetery at Biharkeresztúr-Toldi út is clearly dated to the 6th century (middle or second half) and fits into the type of row-grave cemeteries. The three findplaces 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 RAIDOS INTO ITALY: THE SLOVENIAN ‘PASSING’ PERSPECTIVE
Author(s): Zanekovic, Iztor (Central European University)
Format: Oral

Any (Magyar) raid can be studied from three simplified geographical perspectives: 1. from the region of origins; 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 traces 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 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 tried to cross the Croatian lands to reach Italy at least 25 times. However, there are surprisingly little ‘Magyar’ artefacts discovered in this region: a few arrowheads (Tomoczak grad pri Kobarid, Zidan grad gabi nad Mihovim, Łajštorted Krajna), stirrups (Gradčice nad Trbočanom, Tabor pri Tamuji, Ljubljina nad Zbožiovo goro, Ljubljina) and a possible destruction layer (Blid). 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, Katharina (Northwestern University)
Format: Oral

I present the results of a comparative study of equestrianism in the Hungarian Bronze Age which integrated strontium isotope analysis 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, trade and in 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 reevaluation of Bronze Age narratives of human-horse relationships that have particular consequences for traditional explanations of political authority. There has long been an assumption that the introduction of horses during青铜 Age and the development of the complex societies of the Hungarian Bronze Age, as part of a ‘chariot package’ that allowed for warrior aristocracies to rule the lands 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 forecloses 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 biogeographical 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): Coley, Gergely (Archaeological Institute of the Research Center for Humanities)
Format: Oral

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 Uvarovian-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 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 reseachers even tried to detect population movements by examining 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 relationship to earlier sites or features of physical geography including hydrography, relief or land cover. Regional analyses on Avar archaeology rest 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 determines generation 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 Bashkirstan no doubt has connections in the Karakulturenskiy materials (ancient Magyars), it’s a Siberian version with no monuments just ceramics. As a result, ceramic-stratigraphic analysis proves the impossibility to point “Kushnarenkovo” pottery as an independent horizon. It suppose these sherds are examples of pottery imported by separate nomads groups from Asia steppes (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 rites, where the graves with “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. However, 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.

The few cases known from Siberia only make possible a detailed comparison of the elements of 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 6th – 7th centuries AD for a whole Ural-Siberian region.
Bronzization has been theorised as the globalisation of Bronze Age in Afro-Eurasia, which is envisioned as an overarching phe-
omenon 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. 
Thus, we can assume that the Trans-Ural materials of the 9th – 10th centuries AD most likely 
represent a rather unique version. Eastern analogies can also be found, the closest are from the Don and Donets region (Krimskoje 
area, the left bank Cimljansk fortress, Novalimarivska, Dmitrievskoje). Another close analogie is Biljar at the central flow of 
the Páva river. 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 
area, the left bank Cimljansk fortress, Novalimarivska, Dmitrievskoje). Another close analogie 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.

The most of these objects are horse-bits, but we can identify buckles and decorative elements, and some of the items refers to 
the saddles. The findings from Veszkény and Haukirkhean are really impressive parts of the langobard goldsmith’s art. The harnesses 
from Veszkény are really good examples of the I. Germanic animal style. The harnesses are mostly buried with males, but sometimes we can find them in females burials too. It’s really interesting, that the richest and most beautiful harness findings belongs to woman.
2 WHY IS THIS EMPTY? THE ROLE OF OPEN SPACES IN IRON AGE FORTRIFIED SITES: CASE STUDIES FROM GERMANY TO SPAIN

Author(s): Fernández-Díez, 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 unfurnished 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 Alto Burg near the Heuneburg in southwest Germany; 2) the public spaces in the territory of the Late Iron Age Tumuli 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): Mazacikova, Jana - Vančíková, Daniela - Žaža, Petra - Počtař, 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 archaeologically 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 architectural castle phases evolved into two-palace disposition, keep, three towers on main wall and zwing 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-Tâmașchi, Cristina (Museum of National History and Archaeology Constanta)

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 analysed. 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 shake chisel. Most pots of supplies, 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 practised 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 cereals 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 6-10 centuries. It was observed how in Hârșova, as well as in other settlements on the Danube line, starting with the 11th century, the public spaces in the territory of the Late Iron Age Tumuli in eastern Gaul; and 3) the ‘acropolises’ of Late Iron Age hillforts in north-western Iberia.
4

IT’S COMPLICATED: SEX, GENDER AND BRONZE AGE BURIALS

Author(s): Rabay-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 independently of 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 has enabled the identification of chromosomal sex with a high degree of certainty (intrasex variations and disorders of sex development still cannot be easily recognized).

These analytical advances present fresh opportunities to investigate sex-based differential treatment of children’s investigations of infanticidal, 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 seeing without losing sight of gender concepts beyond the male/female dichotomy? In this contribution, we 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 Theune 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” (1999: 106). However, Theune largely glosses over the possibility of female death-style. As part of my ongoing dissertation research, I explore the possible meanings of the assemblages found in extra female tombs 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, stapled-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 posthumous 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 Iron Age to late historical period, I will 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 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 locales. 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/ or architectural attributes. We examine the ways the graves were created, furnished and marked out and test the visual architecture of these spaces, exploring if the dead were instrumental in chronographing the experiences of access, movement and visibility for the living.

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 invest 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 fossi 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 cemeteries 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 locales. 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 or architectural attributes. We examine the ways the graves were created, furnished and marked out and test the visual architecture of these places, exploring if the dead were instrumental in chronographing the experiences of access, movement and visibility for the living.

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GENERAL SESSION - CERAMIC AND OTHER TECHNOLOGIES

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

Chair: Harold, 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): Ahrens, 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 at least since the Early Neolithic, and such a phenomenon characterizes all phases of prehistory, each 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 cal. BCE) and is based on a typological and archaeometric study of ceramics from the Italian and Balkan Peninsula. During the 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., Trinacria), the percentage of Dalmatian models in the archaeometric record is extraordinary, accounting for nearly 50% of all the vessels recovered at the site. Such extraordinary intensity 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
The Middle Volga region is located in the European part of Russia. Post-Neolithic Krasnosostovskaya 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 Krasnosostovskaya ceramics was carried out according to the method developed by A.A. Bobrinetsky. The historical and cultural approach involves the identification, accounting and study of specific labor skills with which ceramics were made. Fragments from 134 vessels of Krasnosostov were analyzed: Red Bridge II, III, Pine Mane II, Dubovksaya VIII. Its chronological framework fits into the interval from 4250 to 3900 years of armed forces. This ceramics is represented by vases ornamented with a comb stamp and patina. For the manufacture of dishes, clay 76% and silt clay 24% were used as the initial plastic raw material (PROM). The materials were selected plastic raw materials (silt clay 84%), less often sand 16%. Krasnosostv ceramics are characterized by raw materials in a naturally moisturized state - 98%. The following were selected as artificial additives: chaff (CH); organic solution (OS). Potters on three recipes: IRM + OS + CH (0.5-3%) – 32%; IRM + OS – 3% (more 3%); IRM + OS + CH (more 3%) – 65%. IRM + OS + CH (more 3%) – 32%; IRM + OS – 3%. The heterogeneous views indicate the formation of the Krasnosostov population as a result of mixing at least of two population groups. Before the appearance of the Krasnosostov region, two Neolithic cultures were represented in this region: Kama and pitcomb ceramics. The interaction of these population groups led to the formation of pottery of the Krasnostost type.

Project: RGF N1 19-78-10001.

The CERAMIC PRODUCTION OF CORÒBA (ANDALUSIA) IN THE 16TH-17TH CENTURIES. ARCHAEOLOGICAL STUDY AND FIRST ARCHAEOMETRIC CHARACTERISATION

Author(s): Llorenç Marta, Buxeda Garrigós, Jaume, Madrid 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 that have been gathered and their productions have been profoundly 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 Tecnocultural research project (Technological impact in the colonial New World. Cultural change in pottery archaeology and archaemometry – HAR2016-75321-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.

SUPPLYING BLACK GLOSS POTTERY TO THE CITIES OF NORTHEASTERN HISPANIA DURING THE LATE REPUBLIC: AN ARCHAEOOMETRIC APPROACH

Author(s): Madrid 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 them to the markets of the rest of the Mediterranean. Last Republic 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 archeometric 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 a sample of 172 individuals characterised chemically and mineralogically by means of x-ray 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 glaze, 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.
BRONZE AGE WOOL TEXTILE FROM THE SOUTHERN URAL REGION: 14C DATING AND ISOTOPE STUDY

Author(s): Kuptsova, Lidia (Orenburg State Pedagogical University) - Ishishina, Natalia (State Historical Museum, Moscow) - Orinskaya, 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 the trajectories of the wool textile production process in the Southern Ural region during the Bronze Age, a technological analysis of 5 wool remains from five Bronze Age sites was carried out. To determine the precise chronological context of the woolen samples, three samples of textiles were submitted to direct 14C AMS dating. Variability in the ΔR700/860 values for the wool textile analyzed samples, with respect to locally bioavailable strontium in plants was identified.

All woolen samples come from the Suburana graves which date to the beginning of 2000 BC. They are represented by pieces of woven textiles, braids consistently produced from non-plied yarns. Technological analyses helped reconstruct that they were fragments of composite clothing or costume accessories. 8700/860 isotope data suggests that in several cases wool textiles 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 Ural region and Kazakhstan. The research was supported by the RFFR grants.

THE MEANING OF DIFFERENCE – CHANGES OF MATERIAL CULTURE IN THE EARLY IRON AGE

Author(s): Orlaśka, 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 methodological analysis of buildings plans. Geometric ornaments on pottery from this period were similarly designed, in this manner human faces 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 every items. The explanation of this fascination with circle and spiral 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, broader sense, the inner structure of the world.

RELIGIOUS CULTS IN CYPRUS IN THE ACHAEMENID PERIOD: PHENOMENA OF CONTINUITY AND CHANGE IN THE ISLAND’S CULTURAL SUBSTRATUM

Author(s): Puppo, Paola (MUR - 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 is determinable in Cyprus but there are various “currents” from the Syrian-Anatolian pressuring on some religious depictions. In the late classical period (5th century BC) we can quote a calcareous stone capital found in the room 47 of the Vouni Palace, a variety of Hethos Egyptian capital. But it is the Phoenician presence that also left several traces on the island, including the inscription ΚΘΙΣ 195 = ΚΑΙ 42, a text bilingual Greek / Phoenician inscribed on a rock wall to the northwest of the modern village of Lamaktis-Lapthou, with the dedication to the goddess Athena, who brings salvation and victory. The Phoenician text is a dedication to ‘Arat and to Phorafyt. The cult of ‘Arat is well represented in Laphethos, since V century BC, the name of the god also appears on a spear coming from sanctuary in Idalim dedicated to Athena. From an inscription of the year three of the king Ba’lamok / 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 sanctuary in Idalion dedicated to Athena. From an inscription of the year three of the king Ba’lamok / 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 sanctuary in Idalion dedicated to Athena.

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 Ural region and Kazakhstan. The research was supported by the RFFR grants.

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. The usual writer dwellings with an earthen fence in the Middle and Ob 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-Vosyag 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 9 separate rooms with an area of 56-450m2. The wooden walls are reinforced and isolated from the outside by an earthen fence. The overhead roof is constructed of poles covered with bark, branch, 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 an 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 method of housing of the medieval population, but also ways to adapt to the harsh conditions of the North.

IS THIS UNIQUE METAL FIND FROM A SHIPWRECK THE MISSING LINK IN THE DEVELOPMENT OF 17TH CENTURY TOILET SERVICES?

Author(s): van der Stok, Jannike (University of Amsterdam; Metals Inc.) - Beentjes, Torry (University of Amsterdam) - Jostoen, Ines (Cultural Heritage Agency of the Netherlands) - von 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 desti- nation. 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 focusses 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 fashionable. There must have been a period where both types have coexisted and where hybrid forms were made.

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 fashionable. There must have been a period where both types have coexisted and where hybrid forms were made.

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.

ARCHAEOLOGY IN THE VIRTUAL RECONSTRUCTION OF XVITH CENTURY CHINESE BRIDGE IN ROYAL LAZENKI MUSEUM PARK IN WARSAW, POLAND

Author(s): Soleciki, Rafal (Cardinal Stefan Wyszyński University in Warsaw) - Golembrek, Andrzej - Zyla, Izna (Archaeological Company INCEDO3D) - Jaskuła, Andrzej (Pracownia Archeologiczno-Konserwatorska NatFarri)

Format: Oral

Chinese Alley is the main route of Royal Lazienki Museum Park in Warsaw, Poland. It was called so in XVIII century, as a reflection of Chinese style popularity. At that time it 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.
“THE HEARTS OF HUMANS CHANGE ABSOLUTELY NOT, THROUGH ALL TIMES.” - OR? THEORETICAL AND INTERPRETATIVE PROBLEMS OF PARADIGM-CONFLICTS IN INTER-DISCIPLINARITY

Author(s): Lindstrom, Torill Christine (SapienCe, Centre for Early Sapiens Behaviour, Coll, 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. humanities, protest both social-constructionism 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 Paleolithic 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 not (from our common past) in Paleolithic Africa, they still bear relevance to interpretation of findings from European Paleolithic.

I will demonstrate how one can be led astray in interpreting Paleolithic artefacts and behaviours by using comparative analogies and notions about typical human behaviour too superficially, while underestimating deep 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 obsession approach (Ingold 2001), triangulation between quantitative and qualitative methodologies, and not only inter-, but trans-disciplinarity will be advocated.


Author(s): Barrow, Ezra (Universities of Toronto and Buffalo) - Lindstrom, 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 archeological record. Third, we do an “ethnographic” analysis of archaeologists. The authors’ show colleagues different archelogical 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 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 not (from our common past) in Paleolithic Africa, they still bear relevance to interpretation of findings from European Paleolithic.

WHAT KIND OF STORIES CAN YOUR BUG TELL ME?

Author(s): Hodcek, Jiří (SHIFT)

Format: Oral

Insects are the most abundant group of organisms. They colonise all trrophic niches including dead bodies or storages of human food. The knowledge about the biology of necrophagous or other synanthropic species is used in forensic entomology, 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. humanities, protest both social-constructionism 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 Paleolithic 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 not (from our common past) in Paleolithic Africa, they still bear relevance to interpretation of findings from European Paleolithic.

BARROWS IN BULGARIA. NUMBERS, PROBLEMS, LEGISLATION, PROTECTION ACTIVITIES

Author(s): Aleksandrov, 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 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 millenium.
num 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 necropoleis had been dug. Bulgarian barrows today are protected by the “Cultural Heritage Law” but most of them are damaged/destructed 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
BURLAI 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 3.936.5 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 in diameter. They were built from the Early Bronze Age to the beginning of Late Antiquity 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 till burial mounds have been excavated and provided interesting information about mortuary practice and beliefs of ancient people. In the last decade 950 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 cultural value”. They must be preserved for the next generations and for the prosperity of the community.

6
EURASIAN BURLAI MOUNDS AS ENDANGERED HOTSPOTS FOR BIODIVERSITY CONSERVATION

Author(s): Desai, Balazs (MTA-OK Landlacakt 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 intrinsically used landscapes remaining patches of steppes vegetation is often restricted to places unsuitable for ploughing. Such places are the ancient burial mounds (so-called kurgans) built by the “Aymara 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 (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 species inhabiting these remnants.

The aim of the presentation is to introduce the audience to the status of Eurasian kurgan sites and their role as biodiversity hotspots in steppe landscapes. The kurgans are a unique habitat type and for the first time we will present a list of kurgan sites that can be used as biodiversity conservation priorities. Since biodiversity conservation is a global task, it is important also to protect their cultural heritage. Therefore, we will present the conservation status of kurgan sites in Hungary, Bulgaria, and Kazakhstan, and the practical methods which can be applied to protect and utilize these unique sites.

The “Cultural Heritage Law” of Bulgaria states that burial mounds are carriers of “historical memory, national identity and have scientific or cultural value”. They must be preserved for the next generations and for the prosperity of the community.
FUNDAMENTAL STELAI OF ITALIC LEGIONARIES IN AQUINCIUM

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 perpetuate their memory to posterity. The inscriptions show the main elements of the deceased (personal name, father’s name, place of origin) and of the region 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 Castorius 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 Bécsi út of Budapest, dated to the second half of the 2nd century AD, of Lucius Varius Pudenta, a legionary from Parma, as documented by the inscription. The stele X Gemina under Trajan was transferred from Germania Inferior to Pannonia Superior, in Aquincum and here the veteran Lucius Varius Pudenta died in his stele.

SACIDAVA AND ITS ROLE OF MILITARY OUTPOST IN THE MOESIAN SECTOR OF THE DANUBE LIMES

Author(s): Motolea, 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 Dobrudja region, Romania, on a hill on the right bank of the Danube - the Musait point, located at about 5 km north-east from Dandareni 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 milal pillar during the time of Emperor Decius). The regular findings attest that an infantry unit, cohors I Cilikum milites equitata, as well as detachments from Legio V Macedonica and Legio XI Claudia were confined to Sacidava. During the period of the Dominion, the partition of the fortification is the host of a cavalry unit curroux equitum scotianorum. 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.D.).

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 found: vessels 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 Moesian 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.D., becoming a representation of power of the Roman empire in an area of continuous conflict.

CORSO: 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 on the Corsica island reality, set between continental coastlines, hence apparently untouched by Northern limits issues and less involved in the North-African Barbary 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 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 evidences; in spite of this, also for this period interesting clues are emerging from recent researches, while some others are waiting 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 afterward the Northern Tyrrhenian Sea is Rutulus 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 island in the wider process throughout the Late Antiquity, the Early Christanity and towards the Middle Age.

517 GENERAL SESSION - "MORE THAN JUST BONES" - UNDERSTANDING PAST HUMAN BEHAVIOUR THROUGH THE STUDY OF HUMAN REMAINS

Theme: 1. 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 REMAINS DOCUMENTING UNUSUAL BURIAL RITUALS

Author(s): Panisini, Antonella (Sapienza University of Rome; Italian Archaeological 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 is located in the Apennines of central Italy, near L’Aquila (Abruzzo region). Here the excavations of the Roman theatre, carried out 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 foundations connected to the working system of the curtain, a hundred 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 deposition 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 Bioarchaeology of the “Museo delle Civiltà” in Rome and Department of Environmental, Biological and Pharmaceutical Sciences and Technologies of “Luigi Vanvetti” 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 tissues of bones 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, but also for the unique burial rritual. 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?
A QUANTITATIVE STUDY OF LINEAR POTTERY CULTURE CEMETERIES
Author(s): Honhakkamp, Yanik (Institut für Urgeschichte und Historische Archäologie, Wien)
Format: Oral

From about 5700 to 4000 BC, the Linear Pottery culture – the earliest archaeological horizon of the Middle European Neolithic – spread across and beyond Central Europe, reaching the Paris Basin westwards to 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 last 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 Next Neighbour”. 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 WinSerio, which demonstrates that by using the right tools, it is possible even for individual archaeologists to analyse large amounts of data on their own.

APPLYING ARTIFICIAL INTELLIGENCE IN SKULL CLUSTERING
Author(s): Kustar, Agnes – Ewing, Sander (Hungarian Natural History Museum) – Nemeth, Endre – Kesmarki, Gergely (ABC Consulting, Budapest)
Format: Poster

The purpose 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 (FacialNet) 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. FacialNet’s algorithm is currently one of the best known face recognition algorithms. Because of the high 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 specifi – cations”, the software is based on artificial intelligence, including machine learning, is able to recognize rules independently or with human help, or to determine rules. Recognising regularity is the end result of learning process that results in the system getting better and better at the given patterns. The Pilot study analysed 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-Generic portrait of Hungarians in the Apadan Age.

SCULPTURAL FACE RECONSTRUCTION OF BÉLA, DUKE OF MACSÓ (12TH CENTURY AD)
Author(s): Kustar, Agnes (Hungarian Natural History Museum) – Balke, András (Debrecen)
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 Köszeg accused the duke of betrayal and brutally kidnapped him by drawing a sword. Pieces of his body were collected by his sister and the other nuns in the courtyard of the monastery. He earthily 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 his face. 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 somatic 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 bones, and muscle attachment using a table from scientific data at 45 measurement points of the skull (BÖHMER-ERTL & HELMER 1984).

This research was supported by The House of Árpád Programme (2018-2023) Scientific Subproject: V.1. Anthropological-Generic portrait of Hungarians in the Apadan Age.

CULTURAL BELONGING IN THE BULGARIAN CEMETERIES: BULGARIANS, ROMANS, AND KINGDOM OF BULGARIA
Format: Poster

The aim of this paper is to present the results of a project which was granted by the European Commission and implemented with the support of the Scientific Research Committee of the Bulgarian Academy of Sciences. The project is focused on studies of the social status and the identity of the different groups of people who lived in the territory of the Bulgarian state in the Middle Ages. The research is based on the study of the material culture of the cemeteries and the analysis of the funerary practices. The project was carried out in the period from 2010 to 2013 in five cemeteries located in the territory of the Plovdiv region in Bulgaria. The results of the research are presented in the form of a series of scientific papers and a monograph, which will be published in the near future.

TREPHINATION ONLY FOR THE PRIVILEGED? CASE STUDIES FROM THE IRON AGE LATVIA (7TH-10TH C)
Author(s): Erkaše, Alisa - Vičāne, Antojāņa - 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 are from female burials. The position of the trephination holes was similar in all cases, typically found in the middle of the skull. In two cases, the trephination holes were located on the frontal bone, in one case on the parietal bone. The purpose of these trephinations is not known, but they are believed to be associated with healing or treatments. Further research is needed to understand the significance of these procedures.
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-G095.

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) - Alvano, 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 to Roman times and later on 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 Dyon, the Macedonians’ religious center and federal shrine from the 6th c. BC onward. In 169 BC the city fell to the Romans and in 92/91 BC Dyon 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 Dyon 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 bioarchaeological 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 2019-2015. Funding information: H2020-MSCA-IF-2018, Proposal: 841296-BODICON.

e. ENTHESEAL CHANGES AND THE CONFOUNDING EFFECTS OF SEX, AGE AND BODY SIZE ON ACTIVITY INTERPRETATION: ANALYSES OF MEDIEVAL EXETER

Author(s): K. 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 entheseal areas. Enthesal 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 entheseal origins (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 entheseal areas from the upper limb and pectoral girdle, namely M. biceps brachii insertion, M. triceps brachii insertion, M. brachioradialis insertion, M. biceps brachii origin (long head), M. brachialis insertion, and the clavicular attachments of the supraclavicular ligament. The Osteoarchaeological assessment method (Henderson et al., 2016) was used to score a medieval sample from Exeter. This presenter shows the results of the first focus 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

Author(s): Lengyel, Dominik - Touloise, Catherine (BTU Cottbus-Senftenberg)

Format: Oral

In 1975 Milton Gatch wrote an article entitled Noah’s Raven in Genesis A and the Illustrated Old English Hweatu, 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, and in all others the raven sits on a blazoned corpse floating near the ark. Gatch’s search for an explanation is unfilled 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 M11 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 wrath as a punished 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 legal and spiritual fears of late Anglo-Saxon society.

2 A MULTIDISCIPLINARY APPROACH TO ARCHAEOLOGICAL STUDIES: AN INVESTIGATION THROUGHOUT SILENT CINEMA

Author(s): Merca, 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 to deepen the 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 enhancing the role of the iconographic elements and the archival material. How can this give us a better understanding of the interpretations 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, Mâlié, in his “Le monstre”, will contribute in the shaping of one of Egypt’s most iconic image: the Sphinx with pyramids and palms in its 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 Hellacussa 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 headsets, presentations, 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 impulsive 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 HYPOTHESIS

Author(s): Lengyel, Dominik - Touloise, Catherine (BTU Cottbus-Senftenberg)

Format: Oral

Archaeological hypotheses about architecture are mostly mediated verbally or by drawings or sketches. Both contain a variety of 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-
pression of life in ancient times that dominate and cover the architectural essence of what archaeologists determined as scientific hypotheses. If architecture on the contrary is abstracted to its spatial concept and represented accordingly, it reveals and uncover its intellectual contribution to the internal art of architecture. Abstract geometry with reference to architectural design models and photographed as if it was real, provide visual and conceptual metaphors that communicate archaeology, architecture and even sculptures in context in a way that archaeologists use as new starting points for research and architects – through interpretation, as inspiration, as an end, for today’s design projects. Archaeology and architecture thus create an inferential approach to make their work meaningful to the public.

The presentation aims to illustrate this novel method by projects developed by the authors in cooperation witharchaeological research institutions:

- Cologna Cathedral and its Predecessors (by order of and exhibited in Cologna 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 TOPOS 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 Residence combining physical models, auto-stereoscopy and VR experience).

5 CREATIVE INTERVENTIONS AT THE EDGE OF THE TRENCH: THINKING, FEELING, AND DOING

Author(s): Honnis, 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 present. 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 Széctetvár in Hungary as part of an ongoing collaboration between twin-cities of Bath (UK) and Ka- pošvár (Hungary). I was invited on a student 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 haptic 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.
4 AMBER AS A RAW MATERIAL IN PREHISTORY: APPEARANCES THAT ARE DECEPTIVE
Author(s): Czubieszuk, Janusz (University of Adam 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 succin, Baltic amber, whose largest deposits came from the southern 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, but it is the state of the environment is 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 ARTEFACTS’ EVALUATION SYSTEM FOR A SOCIO-ECONOMIC INTERPRETATION. EXPERIMENTAL APPLICATION TESTING ON MIRANDUOLO VILLAGE DURING 16TH CENTURY
Author(s): Menghini, Cristina (University of Pisa) - Palmis, Carla - Nardini, Alessandra - Bertoldi, Stefano (Università di Siena)
Format: Oral
After the so-called “Modern Archaeology” 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 artefacts. Glasses, metals and pottery are the best material evidences to understand the structure of the society. For any of these artefacts we have to establish a different value based on quantitative and/or qualitative levels to define the measure of the richness. To manage the useful results we will set up a parameter according to a specific list of numbers, based on the importance of the markars. In this way we will be possible 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 16th 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. From this context we would propose an analytic method to help the researchers to understand the socio-economic different 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 act 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 Late Bronze Age populations in this region.

7 AMBER IN THE EUROPEAN BRONZE AND IRON AGE: ARCHAEOLOGY, CHEMISTRY AND MICROSCOPY
Author(s): Tsvaltisidze, Auda (Sorbonne Université; Karlava Univeristza)
Format: Oral
The amber has been used since the Palaeolithic until nowadays and was broadly exchanged all across Europe during the Bronze Age (2000-800 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 datas with chemical and micro-analyses ones. Infrared spectroscopy helps to determine the origin of the samples whereas new technologies such as high-resolution microscope enable to identify tools 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 AND 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 (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 archeometrically characterised by means of X-ray fluorescence (FRX) and X-ray diffraction (XRD). The next step is the characterization of maiolica products found in archaeological well-dated contexts of Barcelona, with the willingness of 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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